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ABSTRACT

The focus of this study is the implementation and effects of high school graduation requirements enacted as a result of the recent wave of state reforms of education. The study concentrates on high school graduation course requirements. Interview data on the intent and effects of the requirements were gathered in six states, 24 districts, 32 high schools, 9 junior high schools, and 18 elementary schools. Over 700 interviews were conducted at the state and local levels. combined. A chapter is devoted to the current requirements as well as the change in requirements. The effects of requirements on course offerings in terms of change in and quality of course offerings are discussed. Respondents generally regretted the loss of vocational and elective courses but perceived this as a strong public support for higher standards. The paper concludes that the requirements were a qualified success because they produced broad-scale change of a type likely to make some difference in ultimate policy goals. Appended are 54 references and three tables. (SI)

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The Implementation and Effects of High School Graduation Requirements:

First Steps Toward Curricular Reform

William H. Clune
with
Paula White and Janice Patterson

EA 020 755

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ABSTRACT

Increased high school graduation requirements were the most common change in policy in the recent reforms of education. Forty-five states raised requirements. Forty-two states added requirements in math, science, or both.

Interview data on the intent and effects of the requirements were gathered in six states, 24 districts, and 32 high schools, selected to insure significant policy impact (change required) and variations in state and local capacity. Over 700 interviews were conducted at the state and local levels combined. A reduced sample for some of the data on graduation requirements included four states, 13 districts, and 19 high schools.

Affluent schools and districts and college preparatory students typically were not affected by the reforms, usually because they already responded to higher university entrance requirements. Four of 13 districts had total credit requirements which equalled or exceeded the state's, and almost all districts had some preexisting requirements which reduced the change needed to meet the new state requirements.

Nevertheless, math or science courses or sections were added in 12 of 13 districts, 17 of 19 schools. On the average, four sections of math and five of science were added in these schools. Rough calculations translate this change into an extra math class for 27 percent of the students, plus an extra science class for 34 percent of students in the (mostly urban) schools of our sample affected by reform. Social studies courses also were frequently added.

The courses added were overwhelmingly at the basic, general, or remedial level, suggesting that the reforms provoked a national experiment in math and science education for middle- and low-achieving students. Apart from scattered evidence of watering down of course content, little is known about the quality of the courses, especially what kind of standards they set for the particular kinds of students affected. Despite respondents' views to the contrary, the requirements may not have increased dropout rates; but concerns do exist about the quality of education offered to at-risk students in order to keep them in school.

Respondents generally regretted the loss of vocational and elective courses and were not sure what policymakers intended to achieve through the new requirements. Respondents also perceived strong, but mostly uninformed, public support for higher standards.

The paper concludes that the requirements were a qualified success because they produced broad scale change of a type likely to make some difference in ultimate policy goals (a more rigorous and uniform curriculum, higher achievement scores, and improved work skills). Against more ambitious goals, such as national competitiveness, the results were modest at best. Pursuing the agenda of curricular reform to its desired ends will require major improvements in policy design and implementation (such as more careful attention to the content of courses, targeting of courses to specific groups of students, and technical assistance to schools and teachers).

ACKNOWLEDGEMENTS

This paper went through several drafts and involved an unusual number of researchers and commentators. Original data in the core data base were collected by researchers from the then constituent institutions of the Center for Policy Research in Education (CPRE): (Rutgers University, University of Wisconsin-Madison, and the RAND Corporation). Valuable comments on two earlier drafts were made by Richard Elmore, Susan Fuhrman, Michael Kirst, Janice Patterson, Andrew Porter, Alan Rosenthal, Marshall Smith, Carl Van Horn, Sheldon White, and reviewers at OERI in the U. S. Department of Education. Valuable comments on a later draft were also contributed by Richard Murnane and Thomas Payzant.

Janice Patterson prepared Table 1. Paula White did important work on analysis of the core data and wrote a draft of the sections on coursetaking changes and respondents' perceptions of effects. A related working paper by Lorraine McDonnell drawn from the same data base was helpful and is cited several times throughout the text.

Lisa Armstrong did her usual superb job with technical processing, improving the quality of the product and saving endless hours.

* * * * * *

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INTRODUCTION

This is a study of the implementation and effects of high school graduation requirements, one of the student standards enacted as part of the recent wave of state reforms of education. Student standards are conditions required for the receipt of educational benefits which also have an impact on various aspects of the school program such as curriculum design, counselling, and course selection by students. Student standards were a common feature of the reform movement, including 45 states with increased high school graduation requirements, 21 with longer school days, 14 with new or modified high school exit exams (in addition to the 7 already having such exams), and a few with minimum gradepoints (applying to athletes and others) (McDonnell, 1988; U.S. Dept. of Education, 1984).

The study concentrates on high school graduation course requirements because such requirements were the single most popular type of reform and because, on theoretical grounds, graduation requirements promised to have the greatest impact on student learning. In regulating the curriculum (both coursetaking and course offering), graduation requirements are aimed at controlling the content of education; and content has been linked empirically with gains in achievement (Borg, 1980; Jones, Davenport, Bryson, Bekhuis, & Zwick, 1986; Koretz, 1988; Raizen, 1988; Raizen & Jones, 1985; Wiley & Harnischfeger, 1974; Wolf, 1977). We also anticipated that graduation requirements stood a reasonable chance of meaningful implementation, despite inevitable local variation, because of the existing foundation of curriculum management and regulation and general support for the value of academic education among educational professionals.

Thus, of all the reforms, graduation requirements seemed most likely to achieve the general objective of a more rigorous academic education. But serious questions also existed about the extensiveness and quality of implementation. The requirements themselves usually are quite general ("mathematics" rather than "algebra") and legally may be satisfied with various levels of the same course (e.g., remedial, general, academic). Even courses with the same label may have different content, despite the influence of curriculum guides and standardized subject matter tests. (See Resnick and Resnick [1985] and later sections of this paper for the intended interplay of graduation requirements and control of course content.)

Local districts and schools vary greatly in the amount of change required to meet the new mandates, and in capacity to meet them. Some districts have requirements equal to or even greater than the new state requirements (partly as a bandwagon effect of reform); others have non-existent or very low local requirements. Some districts and schools have mostly college-bound students who probably already met the requirements, either because of their own academic goals, or because of university entrance requirements (often raised during the same period as graduation requirements). Other districts have mostly low-achieving, non-college-bound students for whom the new graduation

requirements demanded a substantial shift in coursetaking. Variation in local educational goals (e.g., vocational education, electives) is extensive, suggesting substantial interpretation and modification of mandates to meet local needs. Thus, local adaptation of the mandate, and some avoidance, was to be expected (Clune, 1983; Elmore & McLaughlin, 1988; McDonnell, 1988; McLaughlin, 1976, 1987).

The combination of a relatively strong policy instrument aimed at educational content (graduation requirements) coupled with the potential for enormous local discretion and variation made the achievement of policy goals seem both promising and problematic. Would the requirements be successful in meeting goals such as those suggested by the "bible" of school reform, A Nation at Risk (National Commission on Excellence in Education, 1983):

- A more uniform and less diluted curriculum, rather than a "cafeteria-style curriculum in which the appetizers and desserts can easily be mistaken for the main courses." (p. 18).

- Reversal of the trend away from vocational and college preparatory courses toward "general track" courses. (p. 18).

- Raising the low percentages of students taking regular academic courses, such as intermediate algebra, French I, geography, and calculus. (pp. 18-19).

- Supplementing academic math and science courses for college-bound students with "new, equally demanding ... curricula" for those who don't contemplate college. (p. 25).

As we will see, the actual effects of the graduation requirements and other reforms were quite varied relative to these goals. Math and science courses were added in response to state high school graduation requirements, but they were mostly at the basic, general, or remedial levels. Vocational courses declined sharply. We know from other research that there was an increase in regular academic courses (algebra, biology, etc.), probably largely due to increased university entrance requirements (Grossman, Kirst, Negash, Schmidt-Posner, & Garet, 1985; Hanson, forthcoming; Westat, 1988; Goertz, forthcoming). But the academic curriculum remained quite stratified because the new academic courses added for the non-college bound were generally not traditional academic courses but rather basic, general, or remedial courses.

Different combinations of policies affected different states and districts in different ways. Besides the cumulative effects of state graduation requirements and university entrance requirements on different groups of students, testing programs (old and new) had an influence on course content. Newly developed standardized subject matter exams (roughly similar to the New York State Regents exams but often developed and administered at the district level) regulated the content of additional courses and sections. Some new courses were added as preparation for high school exit exams, with their emphasis on basic and functional skills.

In general, to expect that the particular policy of increasing high school graduation requirements would accomplish all of the goals expressed in A Nation at Risk seems global and unrealistic. Rather than producing a high-level, uniform academic curriculum for all students, the requirements affected a particular group of students in a particular way (especially, additions of general math and science courses for middle- and low-achieving students). Rather than achieving all of the goals simultaneously, the requirements achieved some at the expense of others (e.g., more math and science courses at the expense of vocational courses and the perpetuation of both a general and stratified curriculum). In this sense, the requirements were "first steps toward curricular reform." More complete achievement of the goals will require the kind of aggressive, difficult, but also inspiring and promising policy changes recommended at the end of this paper.

SUGGESTIONS FOR ABRIDGED READING

Readers interested in an abridged reading focussing on central findings and conclusions should skip the sections which follow on research methods and the graduation requirements and proceed directly to the section on the effects of requirements on course offerings (beginning page 9). A further shortening of the reading can be obtained by skipping from here, or from that section (ending page 12), all the way to the conclusions and policy recommendations at the end of the paper (beginning on page 33).[1]

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[1] This paper is but one of several related papers on the effects of graduation requirements and other student standards forthcoming from the Center for Policy Research in Education (CPRE) which include: a longitudinal study of enrollments in Dade County, Florida (Hanson, forthcoming), replicating an earlier PACE study of enrollments in California (Grossman, Kirst, Negash, Schmidt-Posner, & Garet, 1985); two smaller studies, from the same data base used in this paper, one on the reasons for varying patterns of course offerings (including policy considerations), the other on effects of higher standards on at-risk students (both expected in early 1989); and a longitudinal study of transcripts in four states (expected in late 1989). Readers also are referred to an analysis done by The RAND Corporation for a different project from the same data base used in this paper (McDonnell, 1988). Other relevant research includes a longitudinal transcript analysis of reform states in progress by Research for Better Schools (reported by Rossman, Wilson, D'Amico, & Fernandez, 1987) and a longitudinal study of a national sample of transcripts commissioned by the U.S. Department of Education (Westat, 1988). As discussed in footnote 9 and accompanying text, data from all available studies are basically consistent with each other and with the results reported in this paper.

RESEARCH METHODS

THE CORE DATA BASE

Data for this study came from CPRE's core data base of information on six states (Arizona, California, Florida, Georgia, Minnesota, and Pennsylvania). The six states were selected to represent, among other things, a range of student standards policies, especially graduation requirements. Interviews were conducted at the state level to determine policy background and content. State-level respondents included chief state school officers, governors' aides, legislators, legislative staff, specialists in departments of education, and commentators outside the government, like journalists and academics. The state-level interview process yielded 188 interviews as well as much documentation.

Within each state, at least three districts were chosen to represent a range of policy impact and local capacity (that is, districts which would need to change more and less in response to the policy and districts which might be able to respond more and less easily). Within the districts in each state, we selected a sample of schools, again representing a range of policy impact and capacity (for example, we chose schools with varying percentages of high- and low-achieving students). The six-state sample included 24 districts, 18 elementary schools, 9 junior high schools, and 32 high schools. There were 524 interviews conducted at the local level (226 district; 298 school).

Respondents at the district level included superintendents, assistant superintendents, and policy specialists within the district administration, as well as board members, journalists, union leaders, and representatives of parent and interest groups. School-level interviews included teachers, principals, assistant principals, and department heads.

REDUCED SAMPLE FOR STUDENT STANDARDS PROJECT

For reasons explained more fully below in the discussion of the graduation requirements, the local sample for graduation requirements eliminated Minnesota and Georgia from the research on changes in course offerings. This leaves four states supplying data on changes in course offerings (Arizona, California, Florida, and Pennsylvania) and five states on general questions about the impact of reforms (those four states, plus Georgia). Table 2, located at the end of this paper, reports changes in course offerings in 19 high schools of the four states, while Table 3 (also at the end of this paper) reports respondents' perceptions of effects in the districts and schools of five states. For our limited examination of curriculum alignment policies, we looked at districts in all six states.

INTERVIEW QUESTIONS

Respondents at every level were asked a range of questions on context and various kinds of policies (e.g., student standards, teacher policies, monitoring, computers). The findings in this paper derive mainly from the questions on student standards incorporated in the interview guides and the documentation which was collected to help answer those questions in more detail. The questions were developed to fit a theoretical framework, developed from implementation and other research, that focuses on the effects and feasibility of policies, as well as the support they engender.[2] Effects include both student achievement and other outcomes, like educational stratification. Feasibility includes both financial and administrative costs and problems. Support refers to the conformity of the policies with beliefs of actors in the system about the most desirable practice.

OVERVIEW OF RESEARCH METHODS

The data in this paper consist of self-reports from the field about the implementation and effects of graduation requirements from people closely involved with the policymaking and educational process at the state, district and school levels. Such data have both advantages and disadvantages compared with more quantitative behavioral data, such as longitudinal studies of changes in coursetaking and dropout rates. Disadvantages are unreliability, ambiguity and conflicts in the data and difficulty in measuring the exact size of effects. We found that we could distinguish reliable from unreliable data. Respondents had no direct knowledge of dropout rates, and their estimates were not supported by local data. But some respondents knew a great deal about course offerings, and their estimates of changes are quite close to available quantitative data (including our own).

Advantages are efficiency (speed and low expense) and ability to probe the explanations for effects. We were able to gather a large amount of data about multiple policies in a short period of time.[3] We could isolate reform as a causal factor by asking respondents what they did in response to reform

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[2] A more complete explanation and justification of this framework of effects, feasibility and support may be found in the original proposal for this research (Center for Policy Research in Education, 1985).

[3] Data were collected by researchers of the three institutions which initially comprised CPRE (Rutgers University, RAND Corporation, and University of Wisconsin-Madison). Policies examined included student standards, teacher policies, computer policies, and monitoring (or indicators). State interviews were conducted in Spring 1986. District and school interviews were done in early and late Spring 1987. In general, the local interviews took place very close to the initial implementation of the requirements. As seen from Table 1, the effective date of the requirements in three states was 1987 (AZ, CA, FL); in Georgia, 1988; and in Pennsylvania, 1989. Although, at the time of our interviews, the first class of seniors bound by the requirements were juniors in Georgia, and sophomores in Pennsylvania, schools in these states had already put the necessary courses in place so that students could take them before their senior year.

(rather than relying on numerical data which reflects the influence of a multitude of factors); and we could examine the interrelationships of reform and other factors (e.g., other policies, school planning, school demographics).

This study also shares the usual limitations of elite interview data. Since we did not spend much time observing schools, we could not probe certain kinds of effects. For example, we have no way of knowing how strictly schools were actually enforcing graduation requirements, although we talked to the school people who were spending a lot of time doing the necessary paperwork. More importantly, although we did discover many suggestive examples of varying course quality, we could not go systematically below the level of course labels to examine course content. Extensive, new and as yet undeveloped, indicator systems would be necessary to provide comprehensive data (McDonnell, 1988).[4] CPRE does plan future research on the content of carefully selected courses (probably the low-tier math and science courses that were the most common response to reform).

All in all, we felt that the method was cost-efficient and generated a large amount of information about both patterns and variation that would have been difficult or impossible to obtain in any other way.

This concludes the discussion of research methods; we now move to the presentation of data. The next section of the paper will analyze published data on the state graduation requirements (total and distribution of credit requirements, etc.). Then follow a number of sections based on our own data which discuss: changes in course offerings, respondents' views of effects, dropout rates and at-risk students and implementation and costs. Following our presentation of data are sections on overall conclusions and policy recommendations.

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[4] This concern over compliance is heightened because we found that the six states do not monitor compliance with graduation requirements. Three states, California, Florida, and Georgia, have the capacity to monitor student records through electronic data, or are developing the capacity to do so. See the discussion on page 31. See also McDonnell (1988).

THE NEW GRADUATION REQUIREMENTS: SIZE, STRUCTURE AND CHANGE

Changes in graduation requirements across the nation are reported in Table 1 (located at the end of this paper) based on recently available data. Table 1 breaks the requirements down into the core subjects of English, math, science, and social studies and combines into an "other" category all other requirements (i.e., specific requirements, like physical education and fine arts, as well as non-specific credit requirements). In addition to the fact that 45 states made some sort of change in graduation requirements, Table 1 also shows that 42 (84 percent) increased requirements in math or science, or both. This emphasis on math and science was also seen in our examination of the types of courses actually added in our sample states.

CURRENT REQUIREMENTS: CORE ACADEMICS AND OTHER

Probably the simplest place to begin a comparison of high school graduation requirements is with the specific requirements in the core academic subjects of English, math, science, and social studies. In this respect, the six states fall into three groups. Florida and Pennsylvania have the highest requirements with a pattern of 4 English, 3 math, 3 science, and 3 social studies, or 13 total credits in these core subjects. The next group includes Arizona and Georgia (general diploma), with a pattern of 4 English, 2 math, 2 science, and 2 1/2 or 3 social studies, for total requirements in these subjects of 10 1/2 or 11 credits.[5] Close behind is California, with the same profile, except for 3 credits in English rather than 4 (10 total credits). In last place is Minnesota requiring 4 English, 1 math, 1 science, and 3 social studies, for a total of 9 credits of specific requirements in core academics.[6]

Other sources of variation are total and unspecified credits, often referred to as "electives," but perhaps more accurately thought of as required electives. In terms of total credits, the states again fall into three groups: Florida with 24, Arizona, Georgia, Minnesota and Pennsylvania with 20-21, and California with 13. Apparently, California's lower number of total required credits does not really translate into less work for students, because local districts invariably make up the difference with requirements of their own.

The total credit requirements might be put in perspective by remembering that a high school credit is universally defined as a Carnegie unit--five classes

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[5] The precise Georgia requirements are two math and one science or the reverse; a total of three in math and science.

[6] To put the Minnesota requirements in perspective, one should realize that many local districts have requirements somewhat higher than the state's and that the entrance requirements of the University of Minnesota resemble those of Florida. Minnesota is among the national leaders in achievement scores and high school graduation rates.

per week for one entire school year. A requirement of 20 total credits thus occupies a five-period school day for all four years of high school (five classes per year for four years).[7] Florida's requirement of 24 credits occupies all classes of a six-period day. Although the allowance for electives lessens the restrictiveness of the requirements in some ways, required electives do have bite. Students must earn the total credits, even when they fail and must retake core academic courses.

CHANGE IN REQUIREMENTS

Change in requirements can be analyzed against two baselines: previous legal requirements and previous practice, including requirements other than the state's (district, school and university entrance requirements) and coursetaking patterns which exceed requirements (behavior often exceeds regulatory minimums).

Change in legal requirements can be measured by the total number of new required credits in the four core academic subjects (see Table 1). In those terms, the states rank as follows: Florida (13), California (10), Pennsylvania (6), Arizona (3), Georgia (2), and Minnesota (0); or by new total credits: Florida (24), California (13), Pennsylvania (8), Arizona (2), Georgia (1), Minnesota (0).[8]

Required change in practice cannot be determined just from looking at change in legal requirements. The results reported in the next section provide estimates of which courses were, in fact, added in response to the reforms. We did learn before commencing fieldwork that, prior to the reforms, the majority of California districts required 22 total credits (more than the state total), that 75 percent of Pennsylvania districts required at least the state minimum of 21, and that almost all of Arizona's 226 districts already required 20 units (McDonnell, 1988). However, even when local districts required the same or a greater number of total credits, many did not require the same mix of specific courses as the state, and, consequently, needed to add new ones.

Some inferences about the amount of change required also can be drawn from test scores and graduation rates (see Table 1). Higher scores and rates may correspond to higher levels of academic coursetaking. Florida and Pennsylvania, the states with the two highest requirements and legal change,

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[7] A complete picture is somewhat more complicated than the numbers imply. There is variation among schools in the length of school year and class period. There is also variation in how time is spent in schools. As an extreme example, in one of our districts, students were held to the required number of hours in school, but these hours could be partially fulfilled by completing chores such as scrubbing bleachers in the gymnasium after school or on Saturdays.

[8] Interviews revealed that Minnesota's nominal increase in requirements was entirely due to the adding of 9th grade to requirements previously governing grades 10-12. In reality, the combined 9-12 requirements have not changed in 60 years.

differ sharply in graduation rates, Pennsylvania's graduation rate is 78.5 percent, 14th in the nation; Florida's 62.0, 50th in the nation. Minnesota, the state with the lowest requirements, has a graduation rate of 91.4 percent, the highest in the nation. Except for Pennsylvania and Minnesota, the states fall in the lowest quintile of graduation rates (ranks of 41-50). In terms of tests of student achievement, Pennsylvania and Minnesota have high SAT or ACT scores (15th, 3d), followed by California (9th) and the other states are in the high/middle range (ranks are relative to subgroups of the states smaller than the entire 50, see Table 1).

The various criteria discussed above, point to Florida as a high-change state, California as high/moderate, Pennsylvania as moderate, Arizona and Georgia as low, and Minnesota as no-change. Thus, when we narrowed the state sample for data on new course offerings, we selected Florida, California, Pennsylvania, and Arizona as representing a range of required policy impact. Since we were interested in the effects of change, we needed to concentrate on states where change occurred. Minnesota was eliminated because it had not experienced a recent genuine change in graduation requirements. Besides low change, an additional reason for eliminating Georgia from the local sample on course additions was the complexity of research on its three different high school diplomas (academic, general, and vocational) and associated requirements.

CHANGES IN COURSE OFFERINGS

Changes in course offerings in our sample are reported in Table 2, located at the end of this paper.

Consistent with other data reported above, in 4 of our 13 districts, total district credit requirements equalled or exceeded those mandated by the state. Districts and schools adding few or no courses tended to be affluent, suburban, and white. This pattern confirms consistent interview data to the effect that college preparatory students were mostly unaffected by the reforms, because they already were taking more than the minimum required by the state, often to meet higher entrance requirements set by universities.

The most common changes were additions of math and science. Twelve of 13 districts reported additions of these sections or courses. Seventeen of 19 schools reported additions in math and 16 of 19 reported additions in science. Math and science additions ranged from 1 section to as many as 17 sections (per school). In schools where specific information was available, and where sections were added (that is, not counting schools adding no sections), the average number of sections added in math was 4; and the average number of sections added in science was 7. The science figure is influenced upward by one district adding about 17 sections per school due to the new science requirement and population growth. Disregarding that district, the average number of science sections added was 5.

Considerable caution must be used in relying on these figures as representative of the nation or even the states in our sample. We did not select a random sample of districts but rather districts representing a range of policy impact (change required) and capacity. Even within our sample, we did not have quantitative information on all districts and schools (as can be seen from Table 2). In other words, the statistics on course offerings reported above come from schools and districts which are non-random in unknown ways.

Nevertheless, the figures appear to be roughly consistent with available national data.[9]

One simple way to think about the quantitative impact of the new requirements is that they produced an extra math class for 24-30 percent of the students, plus an extra science class for 30-38 percent, in the schools of our sample (schools affected by reform, weighted toward urban settings).[10] Splitting the difference, we can say that about 27 percent of students took an extra math course, and 34 percent an extra science course. Given the relatively low achievement and low number of math and science courses taken previously by such students, increases of this magnitude represent a potentially significant increment of educational content (depending, of course, on the type and quality of the courses added).

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[9] A national random sample of student transcripts in 1982 and 1987 showed an increase of .44 credits in the mean number of credits in both mathematics (2.54 to 2.98, a 17% increase) and science (2.19 to 2.63, a 20% increase) (Westat, 1988). Assuming a grade-level size of 500, converting our four additional math and seven additional science sections into credits per student yields an average increase of .24 math credits and .42 science credits per student (four sections of math times 30 students per section divided by 500 students per grade level; seven sections of science times 30 students per section divided by 500 students per grade level). Using five science sections added yields an increase of .3 credits. Using a hypothetical grade-level size of 400 (perhaps a more reasonable estimate of the upper-level grades where the extra math and science were added), yields an extra .3 math and .38 -.52 science.

Apart from the unrepresentativeness and imprecision of our data, the relationship between the national data and our data from reform states is unclear. Reform states might be expected to produce larger changes, but the national data extends over a longer period of time and reflects the influence of many policy changes, not simply state graduation requirements (e.g., district requirements and university entrance requirements). If anything, we would expect to observe smaller changes because we included some states with relatively small increases in requirements and because of the shorter time period and single policy focus. To say the same thing in a rather different way, minimum graduation requirements probably are the last piece in a whole series of movements toward a more standard academic curriculum (the piece dealing with lower-achieving students not bound for universities).

The fact that our largest science estimate is close to the national average may be due to the one district with especially large gains in science enrollments.

[10] An increase of four 30-student sections in math represents 24% of a grade level of 500 (120/500), 30% of a grade level of 400 (120/400); taking the lower estimate of science sections, five new science sections represents 30 to 38% (150/500; 150/400). Keep in mind, however, that the range of sections added was quite large. Some schools in some states added many more sections than others.

As for the type of math and science courses added, sections or courses were added in general math, remedial math, consumer math, algebra, geometry and math applications. In science, sections or courses were added in general science, physical science, chemistry, physics, natural sciences, space science, earth science, general biology, laboratory science, and honors biology (see Table 2). The sections added were predominantly at the basic level. Of the 17 schools adding math sections, 15 reported additions of basic, remedial or general. Of the 16 schools adding science sections, 14 reported additions of basic, remedial or general.

A second common addition was social studies (mostly in Arizona and California). Six of 19 schools added social studies sections or courses. The additions ranged from 5 to 14 sections per school and included world history, world geography and world cultures. Other course additions included economics, computer literacy and foreign languages.

As a result of the new requirements, reductions were reported in courses such as home economics, industrial arts, physical education, vocational education, business, psychology, and the performing arts.[11] In some cases, schools did not add new courses but made changes within courses, such as dividing science into biological and physical science or consolidating Arizona history and government into American history and government. In other cases, old courses were given new names to meet the new requirements. For example, "Industrial Arts" was renamed "Practical Arts" in a Florida district to fit the requirements, but the content remained the same.

QUALITY OF THE NEW COURSES

We did not gather systematic data on the content of courses; the above discussion on the types of courses and sections added (mostly basic, general, and remedial) provides the best indication of course quality. Evidently, the reforms amounted to a national experiment in offering lower-level academic courses to middle- and low-achieving students who previously took something else (vocational courses, various electives).[12] Evaluating the quality of such

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[11] In the Dade County study referred to above, most of the sections and enrollments gained by other subjects were accounted for in losses to vocational education. Another "loser" in the enrollment derby was social studies, perhaps reflecting the phenomenon of a "decline to the minimum" sometimes reported by our respondents (students taking the required minimum of a previously popular elective) (Hanson, forthcoming).

[12] A reviewer of this paper, Superintendent Thomas Payzant of San Diego, reports the following divergent evidence about his own district:

> In San Diego, the increases in graduation requirements have led to higher expectations for all students with the implementation of a common core curriculum that will result in gradual elimination of "softer, less demanding" courses in math and science with all students being encouraged to aspire to a pre-algebra, algebra, geometry sequence in math

courses would be tricky, because of the need to specify the ideal content and level of academic courses for such students (was the content pitched too high, too low, or just right?).

We did see scattered evidence of "watering down," indicating that the added course labels cannot be taken completely at face value. Note that many of the examples come from Florida, the state attempting the most ambitious change:

- To meet the new requirements, one Florida district changed from six periods of 60 minutes per day (360 total minutes) to seven periods of 50 minutes per day (350 total minutes).

- In two Florida districts, high school counsellors reported advising students in danger of flunking out to take easier courses to meet new standards (required credits, minimum gradepoint). The counsellors said that previously they had advised such students to try higher-level academic courses to stretch themselves and have a better chance for college.

- In a third Florida district, respondents at the school level reported that attendance and student effort dropped in the seventh period, and students made arrangements with teachers to control the level of homework from multiple requirements.

- One Florida district allowed pre- and post-lab activities to count toward the state's lab requirement.

- Local districts in Pennsylvania were adapting vocational courses to the graduation requirements. At least two of our four local districts in Pennsylvania were allowing students to take vocational courses judged to include competencies related to the new requirements. One district was considering substituting courses like nursing math, baking math, and carpentry math. Legislation in Pennsylvania allows substitution of up to three vocational courses for related non-vocational requirements (e.g., business math for a math requirement). Substitutions are reported to the state department of education by are not subject to its approval.

- In schools with shortages of certified teachers (e.g., in rapidly growing districts), the most common way of staffing new, lower-tier math and science courses was with displaced vocational teachers (McDonnell, 1988).

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and a biology, physical science(s) sequence in science. Bridging courses, tutoring, and support programs will be needed to help those who are not ready for the more demanding courses. Instead of "watering down" courses, we are working to eliminate general and consumer math and add more sections of pre-algebra and algebra. Of course, there are implications for staff training and basic changes in attitudes about student learning and teaching.

- A high school teacher in Pennsylvania stated, "We are just putting new names on old courses. We have rewritten our existing courses into the new planned course format."

- In Arizona, "Government used to be a required one-year course and was reduced to one semester to accommodate the world geography requirement." According to one respondent in an Arizona district, "by forcing 'Government' to be only one semester, students were left with the most boring part."

- An Arizona district specialist said, "Teachers don't have much flexibility. This creates a problem because teachers want to stress their own competencies along with the state ones. Teachers also see contradictions between their own priorities and the state's. This creates a real struggle among areas of emphasis and difficulty in measuring performance. Teachers are forced into teaching courses they're not interested in, which lowers the quality of instruction."

- Schools in states with high school exit exams allocate a significant amount of instructional time to helping needy students pass the exam. Prep courses for exit exams are given conventional sounding labels and may be quite repetitious from one to the other (sometimes despite contrary state law). The right balance between helpful remediation and a slow, narrow curriculum is difficult to strike.

On the other side of the course quality question is the movement toward so-called alignment (a correspondence of curricular guides, textbook content and standardized tests). Graduation requirements and curriculum alignment are designed to work in tandem, one affecting the selection of courses, and the other controlling the content, or quality (Resnick & Resnick, 1985). A Florida respondent captured the intended relationship in saying,

> When we add a third course in general mathematics to meet the new math requirement, it can't be a watered down repetition of the second course, because we have the state and district guides and tests to contend with.

Two of the four states (California and Florida) have adopted curriculum alignment. The more impressive trend toward standardization was at the district level. District standardization occurred in the states with state-level standardization (California, Florida) as well as in the other four states. The local systems tend to cover more subjects in more detail, make more extensive use of data analysis, and employ more explicit reinforcements and sanctions (such as using standardized tests as end-of-course requirements or components of teacher evaluation).

In the six core states, 10 of 20 districts for which we had adequate information have a strong form of curriculum standardization. A breakdown by states is as follows: Arizona, 1 of 3 districts; California, 1 of 4 districts; Florida, 2 of 3 districts; Georgia, 2 of 4 districts; Minnesota, 1 of 3 districts; Pennsylvania, 3 of 4 districts. Seven of the 10 standardizing districts are in large cities.

The actual impact of such policies on course content and quality is beyond the scope of our original research but is the focus of continuing CPRE research on student standards. One major loophole in the capacity of curriculum alignment to control course quality is the lack of control over course selection. A Florida respondent offered this skeptical assessment of the net result of the policies:

> Lower-level students will take Fundamentals of Math and not pass, then take G2, G3, Applying Basic Skills, and end up with Consumer Mathematics. All of these courses have the same objectives and are similar in content. This seems to be the result of the graduation requirements. The minimum becomes the mean. By this I mean we are lowering our standards, expectations, and our focus. We're teaching for the success rate on the basic skills test. That's how we're judged as far as the objectives of the legislature are concerned.

RESPONDENT VIEWS OF EFFECTS

In addition to questions on changes in course offerings, we asked respondents for their own assessments of the effects of the policies. We asked if the policies achieved the effects intended by policymakers, what were the advantages and disadvantages of the policies, whether the policies were supported locally, and whether the policies met local needs.

Respondents' views of effects should not be confused with our own evaluation of effects based on all the data from this study and related research. Respondents views are based upon varying degrees of expertise and knowledge of the underlying facts (for example, the value of academic courses as background for employment). Some of the opinions (for example, regret about declines in electives and vocational education) may be based at least partly on the self-interest of the respondents. Nevertheless, many readers of the paper found the perspectives contained in this section of the paper interesting and significant. Our own conclusions about effects relative to policy intent are discussed later in the paper.

As explained earlier, the data in this section come from a slightly expanded local sample consisting of five states (Georgia added to Arizona, California, Florida and Pennsylvania).

SUCCESS OF THE POLICIES IN ACHIEVING THEIR INTENDED EFFECTS

Nineteen of 35 respondents (in 11 districts providing any data)[13] reported that the new requirements were not likely to produce the kinds of effects that state policymakers intended. Respondents reported that the main problem was that policymakers had not defined their intentions. Here are a few illustrative comments:

> No one really knew what the state wanted.

> The requirements are not likely to produce the effects that state policymakers intended because no one bothered to define the problem they were trying to solve.

> The course requirements are going to kill us here. Policymakers have no sense of realism that more is not necessarily better.

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[13] The question on policymaker intentions was asked only of local superintendents, school board members and the district curriculum director (and not of principals and teachers). This accounts for the relatively low number of responses.

State policymakers have non-research-based notions of what schools ought to be doing. They are well-intentioned, but short-sighted.

It's a classic example of Arizona's knee-jerk approach to education policy; it was totally devoid of any financial analysis. Nothing in the research literature says that more courses equal higher expectations. State policymakers don't understand the dynamics of class schedules. Increasing course requirements reduces students' opportunities to experience more and increases their opportunities to fail.

Of course the new requirements will not produce the effects policymakers expected. They are just "political toys." Not every kid needs all the required courses.

Their intention was to upgrade, but this rigor is putting kids out. Kids have no time for taking the courses they consider most meaningful. I agree with striving for excellence in education, but we need to ask ourselves, do all students need all these academics?

Six of 35 respondents (in 11 districts) felt that the requirements were likely to have the effects intended by policymakers. An example:

State policymakers thought that the new requirements would increase the skill levels of students, and the new requirements will accomplish that goal.

Nine of 35 respondents (in 11 districts) indicated that they weren't sure whether or not the new requirements would produce the effects intended since it was too early to tell or it wasn't clear what policymakers' intentions were.

One respondent reported that the new requirements were likely to produce intended effects for the college bound, but not for the others.

ADVANTAGES AND DISADVANTAGES OF THE POLICIES

We summarized respondents' perceptions of advantages and disadvantages in Table 3 (at the end of this paper). Respondents mentioned disadvantages more frequently than advantages, but we will discuss the advantages first.

The most common advantage identified was better college preparation (13 of 32 schools).[14] Respondents who were happy with the effects of the new graduation requirements commented:

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[14] By "13 schools" we mean that at least one respondent in each of 13 schools (of 32 possible) expressed the response described. Due the need to cut questions to conserve interview time, as well as varying knowledge and interest of respondents in particular questions, failure to answer a question has no significance. Consequently, there is no significance to the number of districts and schools where questions were not answered.

The new requirements generate an agenda for the 21st century.

The requirements project an image to the public that the schools are trying.

The graduation requirements will benefit this school in the future because the students will have more basic skills.

The requirements present an opportunity to intensify core academics.

We have sent out a message of higher expectations for all students. We are preparing students better for jobs and raising teacher expectations. We have more periods in the day and more computers in the classroom. The requirements made us look more closely at what we are doing, which encouraged us to do things better.

The new high school graduation requirements are effectively tightening academic standards and raising expectations. Teachers are demanding more from students (e.g., more homework) and students, in turn, are working harder.

The advantage is that students leave high school better equipped, whether they go to college, trade school, or the armed services.

Thank God they increased them. I say that because students seem to come to us less and less prepared to handle high school work. They seem very unprepared. If they want to go to college, they need more skills than they have. The old requirements were good for their time, but now in a more competitive society, we need to give them more experience before they graduate.

The advantage is that students must take meaningful courses, not automatic basket weaving courses.

Respondents predominantly identified disadvantages over advantages. The most commonly cited disadvantages included reduced electives (19 schools), increased dropout rate (17), hurt lower-achieving students (16), and reduced vocational offerings (11). Here are a few illustrations:

It devastated our vocational program. We curtailed offerings of vocational courses. It creates work overload and conflicts for the students.

They have a detrimental impact on the disadvantaged. What good is algebra to someone who is working at K Mart?

The disadvantage is not allowing students to experience other things, to be creative. It stagnates students.

For college-bound students, the new requirements are excellent. For the non-college-bound students, the requirements are, in all honesty, doing a

poor job. We need to offer more classes in day-to-day living problems. I would guess that only 30 percent of our students go on to college.

Teachers are forced into teaching courses they're not interested in, which lowers the quality of instruction.

We've increased the standards of those who have already made it; for those who can compete. But there is a problem for those who can't. I would guess the dropout rate has gone up 10 percent over time.

The requirements have alienated professional teachers. Student satisfaction has decreased. And there are fewer electives in the curriculum.

Because of the increased graduation requirements, the school has lost a lot of kids; they don't have time to take what they enjoy.

The big disadvantage of the increased requirements is that there are no provisions for those students who cannot do well. There is no vocational track with remediation in the basics.

Students are feeling pressured. Their schedules are filled with more academics and they don't have time for electives or extracurricular activities. As a result, students' self-esteem seems to be going down, due to the high academic load, while the number of dropouts seems to be on the increase.

They just don't address needs of the kids not going to college. It's a real problem for those who just want to get a job after high school.

As stated above, the single most common complaint about the requirements was that they reduced the number of electives offered and the number students could enroll in. Respondents reported:

Electives suffered, especially industrial arts, home economics, physical education, and the performing arts.

As a result of the new economics requirement, all social studies electives were dropped including psychology, sociology, California history and geography. Now that economics is required, there is no room in the schedule to offer the electives. That aggravates me quite a bit. This year, we had 54 students who wanted to take psychology and there were supposedly no classrooms available.

We dropped classes in California history and Constitutional law because we didn't have time to teach it and offer all of the classes that are required.

Teachers of electives and vocational education feel less valued than in the past.

> Before the requirements, the school had classes in sociology, anthropology, etc. The requirements cut off the electives. Students did better when they had a choice of classes to take.

Several types of effects were identified by only a few respondents but are important to mention here. These include the opinion that the new requirements increased college enrollment, increased the public's awareness of education, reduced student participation in extracurricular activities, required teachers to teach courses that they weren't trained for, and lowered teacher morale since teachers had to deal with students who were in courses by force rather than by choice.

In some cases, similar responses were identified as both advantages and disadvantages, depending on the respondent. For example, respondents indicated that the new requirements challenged the students, or increased teacher expectations of students, but these effects were considered both advantages and disadvantages. In some cases opposite effects were identified. For example, some respondents indicated that the new requirements increased standards and teachers' expectations of students, others reported that the new requirements lowered standards and teachers' expectations of students. Some respondents indicated that the new requirements helped schools get more money and others reported that the new requirements added expenses (e.g., for hiring more teachers, converting classrooms, and purchasing new textbooks and equipment).

There were also cases of very divergent views within a school. For example, a high school teacher in Arizona was supportive of the new requirements and stated:

> There are no disadvantages. Students are exposed to a broader range of topics in science. Students develop better critical-thinking and formal-reasoning skills.

But the principal within the same school felt that there were no advantages to the requirements, and stated:

> The requirements are an artificial thing that's just fooling people. The requirements are not concerned with what kids need to know for life.

Finally, a few respondents indicated that there were few effects as a result of the new requirements, noting, for example, that the only effect of the new requirements was that some of the names of courses were changed.

SUCCESS OF THE POLICIES IN MEETING LOCAL NEEDS

The overriding opinion of school-level people (including principals, counselors, and teachers) was that the new requirements did not address the districts' real needs. Respondents indicated that different students had different needs and the requirements did not address divergent needs,

especially not the needs of the disadvantaged students, minority students, or the non-college-bound students. Respondents commented:

> The graduation requirements have not addressed the real problems of the district very well. Most students are minority students in the district, and they are the ones hurt by the graduation requirements.

> The requirements do not address the district's real needs. If a student is just going to work after finishing school, why does he or she need social studies? That student needs marketable skills.

> If districts valued such a policy, they would have done it on their own.

LOCAL SUPPORT FOR STATE POLICIES

Faculty support often depended on the department or subject area of the teacher. Teachers of elective subjects (such as fine arts, music, physical education and vocational education) were generally opposed to the changes. As one teacher stated:

> Teachers of elective subjects are very frustrated by the increased requirements. This frustration stems not only from a concern about job security, but also a belief that students should be exposed to their subject matter.

Despite the generally disapproving responses by school-level people regarding the new requirements, the overall responses regarding community support were favorable. Of 14 districts in five states, 9 indicated that the new requirements were generally supported by the community; 3 districts reported that there was mixed support; 2 districts indicated that the community was generally unconcerned or unaware of the changes. Witness the following comments:

> The community thinks the more requirements the better, so they support the increased graduation requirements.

> Our parents want more and more and more. High standards are the norm here.

> Most parents like schools keeping kids longer and making them work.

> The increased requirements are generally accepted in the community; the public sees them as improving the "product."

> Parents are very positive about the increased graduation requirements. They believe in rigor. Parents assume that a school with hard courses and lots of homework is a good school.

> The increase in course requirements has made a favorable impression on the public and all segments of the education community.

In districts where respondents reported mixed support for the new requirements, the division was usually between community support and school opposition as well as between parents of high-achieving and parents of low-achieving students. Respondents indicated that the strongest support came from better-educated parents who wanted their children to take more academics. But it was sometimes also reported that minority groups viewed the increased requirements as a means to raise teacher expectations of minority students.

The following comments are examples of mixed community support within a district:

> It depends on the educational background of the parents; better-educated parents want to see their children take more academics.
>
> The community is divided; the parents are split along the lines of parents of good students who support the requirements and the parents of poor students who are opposed.
>
> A few groups might argue that an emphasis on academics drives out other opportunities for students.

Many respondents indicated that while community support was generally favorable, the public wasn't very well-informed about the changes. The following comments illustrate respondents' views about the lack of awareness or concern on the part of parents and the community:

> Parents and public believe strongly in standards and that increased requirements will make a difference without understanding all the variables.
>
> They are accepted but I don't think the community understood the requirements.
>
> I don't think that the community has any idea or cares what the graduation requirements are.
>
> The requirements are accepted and welcomed by the community, although I'm not sure that parents are fully informed about the stronger requirements.
>
> Since they don't exceed our requirements, no one pays attention.

In a few districts, respondents indicated that the community was very well-informed since school officials had hosted informational meetings and sent copies of the requirements to parents.

DROPOUT RATES AND AT-RISK STUDENTS

A subsequent CPRE report will detail effects on at-risk students, but a preliminary summary is offered here.

Many of our respondents agreed with academic critics (McDill, Natriello, & Pallas, 1986) that higher standards would push marginal students out of school. "Take a kid who can't jump three feet and ask him to jump four feet," they said. But the connection between higher standards and higher dropout rates is conventional wisdom; and our respondents readily admitted that they lacked data to support their perceptions. Emerging quantitative data do not support the connection. Higher standards are related to lower mean dropout rates (Bryk & Thum, 1989). Graduation rates are improving slightly nationwide (Ginsburg, Noell, & Plisko, 1988). A longitudinal study of cohorts in Dade County shows a significant decline in the dropout rate over the same period that academic coursetaking was going up (Dade County Public Schools, 1988). On the basis of these studies, perhaps the conventional image of the higher hurdle should be replaced with a different image of the more interesting and valuable experience.

The argument over standards and dropouts ultimately must be judged as inconclusive. Available quantitative data usually do not correspond to the states raising standards, the time period during which standards were raised, or both. Furthermore, dropout data are notoriously unreliable (Williams, 1987) and subject to manipulation for political purposes. I personally would not be convinced about any longitudinal study of dropout rates without also examining longitudinal trends in exit codes. Some exit codes (stated reasons for students withdrawing from high school) are not counted as dropouts (e.g., transfer to adult education) but may be the functional equivalent of dropping out (for example, when the students never show up for adult education).

Beyond the issue of dropping out is the issue of the effect of standards on the quality of education of at-risk students while they are in high school or alternative programs. Here again the data are inconclusive but supportive of further research. One problem is the unavailability and inconvenience of remedial and makeup courses. Because of unavailability of makeup classes, one of our schools provided cassette tapes for students to listen to on the bus. When students can take makeups, a different problem is the narrowness of the curriculum. We heard stories in many schools of students taking nothing but required, remedial and makeup classes. Some students seem to take nothing but remedial classes aimed at the high school exit exam.

Another problem is watering down of the educational experience. Instead of pushing students out of school, school people seem to be bending over backwards to keep them in. While the ultimate goal of graduation is commendable, some of the rescue efforts are of questionable value (e.g., counselling students into easier courses so they can graduate instead of harder courses so they can go to college). Finally, we caught a glimpse of an

emerging problem with "alternate routes." Alternatives to regular high school seem to be proliferating (night school, special high schools, adult education, certificate programs, etc.). Since students in such programs generally are not counted as dropouts, their absence from high schools would not increase the dropout rate. But alternative routes do raise issues of educational quality. As uncertain as we are about the quality of high school courses, we know even less about high school alternatives. Some of our respondents did complain about the difficulty of keeping students in regular high school when they could take easier night-school courses offering the same credit.

IMPLEMENTATION AND COSTS

We asked appropriate respondents about implementation problems and costs of the new graduation requirements. The consensus was of relatively few serious problems and costs. Almost all respondents said that the requirements were implemented promptly in all districts and schools, in spite of some extremely tight deadlines (for example, requiring new courses in the academic year following legislation in the previous spring).[15] The successful nature of implementation probably can be attributed to three factors: the relatively marginal and incremental demands of the requirements (including the option of adding new sections of existing courses); an operating bureaucratic structure accustomed to the required activity (of developing and offering new courses); and relatively high support among teachers, administrators and constituents for the idea of academic courses, if not for the costs of additional ones (reductions in vocational and elective courses).

The absence of serious problems and costs, however, should not be interpreted as indicating a flawless process. There were problems and costs worthy of the attention of policymakers, as discussed below.

Costs. Three cost categories were noted by many respondents: extra class periods for the newly required courses, extra teachers, and new science labs.

As explained earlier, extra class periods were needed to meet basic requirements and to provide time for remediation and retakes. Some districts were locked into shorter days because of previous cutbacks of state aid, collective bargaining agreements, or limited local resources. Two states, Florida and California, offered financial incentives for longer school days; and other states increased general aid as part of a comprehensive reform package. Costs not covered by state aid required extra local resources. The actual extent of the cost for the extra periods is somewhat obscured in some districts because the extra periods were not strictly necessary to meet state requirements but rather were used to preserve electives.

A need for extra teachers, especially in math and science, was a second cost of the graduation requirements, but the impacts of this cost were quite different depending on local context. In large, growing urban districts, the new requirements changed the mix of new hires and exacerbated the difficulty of finding teachers in the areas of need. In one district with declining

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[15] There are two reservations which might be noted about this apparently universal pattern of compliance: first, as noted earlier, we did not observe the schools in sufficient detail to see if administrative exceptions were being granted; and, second, in at least three of the six states, we were unable to gain access to the small districts initially selected as having the lowest capacity and highest policy impact.

enrollments, the new requirements were used to avoid layoffs. Internal adjustments were common, such as transferring teachers in one area of the curriculum to another area (e.g., physical education teachers teaching basic math). One district found it temporarily necessary to combine basic and advanced math classes.

Extra costs for science labs were a problem in many districts because of the large number of new students taking a lab science course who had never taken such a course before. The shortage was especially acute in districts already facing a serious shortfall of physical facilities because of rapidly increasing enrollments. Once again, adaptations were common. One district instituted the practice of pre-labs and post-labs to meet the state's lab requirement without the students actually occupying a laboratory for most of the required lab time.

Implementation Problems. The most common implementation problem mentioned was a short phase-in period. Local respondents generally felt that legislators were being insensitive and unrealistic, and betraying lack of knowledge of the local needs, in requiring implementation of new requirements over a summer or similar short period. A second commonly mentioned implementation problem was multiplicity of requirements and associated paperwork. One source of multiple requirements is transfers within the same state from districts with different local requirements. Another is the applicability of different requirements for different time periods: seniors subject to one set of requirements, juniors to another set, and so on. (Recall that both state and local requirements were subject to frequent, often related, changes.) The increased paperwork associated with new and multiple requirements often fell to high school counsellors who worked overtime and had less time for counselling. Regulatory burden on counsellors is a common finding across several studies (for example, see Archbald, forthcoming). Legislators might well consider extra aid for counsellors as part of any regulatory package.[16] A final implementation problem is the teacher certification and recertification made necessary by internal shuffling of personnel to new assignments.

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[16] In a review of this paper, Superintendent Thomas Payzant of San Diego affirmed the importance of the counselling role and said that San Diego has instituted an 8th grade parent-student-counsellor conference to plan the high school course of study in light of the new requirements.

STATE MONITORING OF GRADUATION REQUIREMENTS

We asked state-level respondents about monitoring of graduation requirements and checked the results by questioning local respondents. The general pattern is of no regular state monitoring of coursetaking. For example, in Florida program and financial audits are conducted every five years, but there is no monitoring of compliance with graduation requirements. On-site evaluations of a portion of Pennsylvania school districts are "mostly paper checks"; and there is no state monitoring in Arizona.

In many regulatory situations, a pattern of zero inspection and enforcement might well be interpreted as an effort to pass compliance costs to the regulated sector (McDonnell, 1988), or as evidence of a symbolic law not intended to produce behavioral compliance. Risks of non-compliance from such strategies did not materialize in the case of graduation requirements. For the most part, we observed the opposite pattern of widespread, indeed, virtually universal compliance.

Besides the reasons given above, the high level of compliance may also be due to two kinds of potential, as opposed to actual, monitoring: first, the potential for retrospective monitoring of transcripts which typically are kept for long periods of time, and, second, the availability or development of computer data bases in several states which permit rapid analysis of course offerings.

DISCUSSION AND POLICY RECOMMENDATIONS: PARTIAL POLICY, LIMITED RESULTS, AND FURTHER STEPS TOWARD CURRICULAR REFORM

This section of the paper has two main parts: first, a summary of conclusions about the success of the reforms in meeting educational and policy objectives; and, second, policy recommendations based on these conclusions.

THE SUCCESS OF GRADUATION REQUIREMENTS IN MEETING THEIR OBJECTIVES

From the perspective of national reformers, graduation requirements and curriculum alignment were designed to produce a higher level of academic rigor and basic skills in the high school curriculum (National Commission on Excellence in Education, 1983; Resnick & Resnick, 1985). Analysis of our own data at the state level suggests that reformers in our sample had two primary objectives, both consistent with this overall goal: 1) an improvement in achievement scores and work skills; and 2) more uniformity in types of courses taken by students in the direction of standard, high-quality academic courses (McDonnell, 1988). Broader political objectives for the reforms were more diverse than these instrumental policy objectives (Fuhrman, Clune, & Elmore, 1988). A challenge for more rational policy will be discussed further in the Conclusion to this paper.

Evaluating the success of the reforms in meeting the simple-sounding instrumental goals of academic rigor and higher achievement is anything but simple, as evidenced by the extreme differences among scholars, commentators, and public officials on that topic. Legitimate differences can exist about the relevant standards (what constitutes success) and how to evaluate the evidence (the data). I will approach the task of evaluation by reviewing the data in our own and related research against a series of plausible criteria.

Q. Were the graduation requirements a basic success?

A. Yes, on their own terms. The most basic question about success of the graduation requirements is "were they implemented?" This question should be answered before reaching other questions about secondary effects and policy improvements.

It is fairly clear that the graduation requirements were implemented and implemented on a broad enough scale to make a difference. Our data suggest that in schools affected by the requirements (those with a significant number of low- and middle-achieving students), about 27 percent of students are taking an extra math course and 34 percent an extra science course. Many also are taking a new or added course in social studies. Implementation generally was prompt and complete, despite difficult deadlines.

This virtually universal compliance is all the more remarkable in view of less than complete support for the requirements at the ground level. Our data

show that school people have many reservations about the requirements, especially because of reductions in vocational and elective courses for the students affected.

Q. Should the states have gone beyond the minimum and passed even higher graduation requirements?

A. Probably not. Possible criticisms of the requirements are that they were not as ambitious as they looked on paper and that they did not affect all students. It is true that large increases in the legal requirements at the state level invariably translated into relatively small increases in practice, mostly because of preexisting district and university requirements. In some states, the majority of districts and students were not affected at all. But the requirements were successful in changing the coursetaking of the students taking the fewest academic courses (for example, the least math and science). Raising this minimum seems fundamentally consistent with both of the major goals of the reform: greater uniformity of curriculum and higher achievement and work skills in the average American student. Although, like most regulation (McDonnell & Elmore, 1987), graduation requirements raised the minimum rather than the ceiling, raising the minimum is consistent with the goals of reform. That states may have received some extra symbolic credit disproportionate to the real effects does not detract from this conclusion. The goal of raising the ceiling for high-achieving students must be pursued with entirely different policy instruments (e.g., more AP courses, increased emphasis on higher-order thinking).

The alternative of much higher graduation requirements is probably not a good idea. Requiring more academic courses on top of those already mandated (especially without other policy changes) flies in the face of a number of serious problems discussed below such as doubts about the quality of courses added to meet ambitious requirements, pressures on student time and extracurricular activities (and concomitant reductions in effort), further losses in vocational courses and electives, and problems for at-risk students in meeting cumulative requirements. Before considering further increases in graduation requirements, states with high requirements probably should consider redesigning the existing curriculum and making other policy improvements discussed below. Even the states starting with relatively low requirements probably were wise to raise the minimum slowly and proceed one step at a time.

Q. Were the courses offered the most demanding possible for the students affected?

A. Probably not. Given that a significant number of middle- and low-achieving students are taking an extra math and science course, the next most important question is the quality of these courses. The mere fact that the courses are basic, general, and remedial does not necessarily imply low standards, because some kind of adjustments undoubtedly are needed for many high school students. We saw repeated evidence, for example, that the lowest-achieving high school students in math functioned at about a fifth-grade level, or less. Such students obviously require some kind of remedial instruction (although very likely not more of the same low-level drill and practice that they had received up to that point in time, see below). School personnel also believed that many students above the lowest remedial level would have a very difficult time in traditional academic courses.

As reported earlier, we did see some evidence of watered down courses and student course selection (reduced class minutes, courses with repetitious material, science "labs" in regular classrooms, poorly qualified teachers, counselling of students into weaker courses to avoid the increased risk of flunking, etc.). Lacking systematic data, we cannot tell how common such practices were. But there are deeper reasons for doubting that the new courses were the best possible. First, schools typically offer middle- and low-achieving students dull, factual, repetitive material in spite of the fact that their achievement scores benefit more from more demanding, academic courses (Gamoran, 1987; Gamoran & Berends, 1987). Second, designing the right kind of academic course for students of varying levels of achievement is difficult, especially in view of low expectations of teachers and administrators.

Another reason for doubting rigor of the new courses is the lack of effort in the reform process to upgrade instruction while increasing requirements. States did not say, "Offer an extra math course, and we will help you offer the best course possible for all types of students." Graduation requirements were mandates almost totally devoid of technical assistance (McDonnell, 1988).[17] California is apparently unique in our sample in having some kind of program to upgrade lower-level courses (e.g., so-called "bridge" courses allowing students to make a transition from the general to academic

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[17] The effort to control course content through alignment of tests, guides, and texts does qualify as technical assistance (McDonnell, 1988). But neither graduation requirements nor alignment has prevented a proliferation of lower-level courses. In another paper, I say that it is as if the government prescribed a detailed design for all types of automobiles but did not reduce variety and allowed consumers to choose which to buy. The result is everything from Hondas to Porsches. (Clune, 1988). In other words, the capacity of curriculum alignment to upgrade education depends heavily on the existence of a core curriculum.

High school exit exams also have a strong effect on lower-level courses, but these affect a subgroup of students; and the emphasis of the tests is on lower-level basic skills.

track). It is unreasonable to expect that districts and schools under pressure to offer a large number of new courses but lacking any guidance from the state on how to do so would simultaneously embark on a systematic program of upgrading. The opposite tack of lowering quality to help meet the challenge is more likely. We did see certain schools which seemed to have preexisting programs for upgrading courses, and we plan to investigate such schools in a later phase of the research.

Q. Were the new courses better than the ones they replaced?

A. Probably. Doubts about the level and quality of new courses can be extended to become doubts about the value of the reform itself. Is it possible that the new somewhat watered down academic courses are not as beneficial to students and society as the elective and vocational courses they replaced? As reported earlier, school people felt that both vocational and elective courses were important tools for motivating different groups of students to stay in school. In some cases, discontinued elective courses were considered superior to the required courses which replaced them (e.g., elective vs. required courses in social studies).

Since we have little information on the earlier courses, we are in no position to make the necessary comparison. Our sense is that the new courses are both more central to the work skills of youngsters and more demanding than traditional vocational courses (both of which assertions would be vigorously disputed by traditional vocational education advocates). A convenient, if not altogether satisfying, way to answer the question is that the superiority of academic courses was implicit in the reform itself. We could have considerably more confidence in this assertion if we were sure that the new courses were genuinely stretching the capacities of the students.

The precise exchange which occurred most frequently (general math and science for vocational courses) has some disturbing potential. Recall that the "bible" of school reform, A Nation at Risk, decried the trend away from both academic and vocational courses toward the general curriculum (see introduction to this paper). A recent paper (Kang & Bishop, 1988) concludes that wages and employment of non-college-bound students benefit the most from a combination of academic and vocational courses, and lose ground economically from extra academic courses alone. As reported earlier in this paper, many of our local and school respondents expressed similar conclusions about academic and vocational courses for the non-college bound. In addition, it is not clear that basic and general courses help students with aspirations for college. No one doubts the value of core academic courses; but the precise mix of courses which emerged may not have been the best and probably was not given enough thought. As discussed below, the next generation of reform should consider different combinations, such as fewer, regular (non-general) academics and the option of cognitively demanding vocational education.

In the absence of careful research-based thought about the ideal content and mix of courses, it is not clear that the state is a better decision maker about curriculum than local districts and schools. The latter have the

advantage of being closer to student needs, although some districts may be less committed to academics for all groups of students (see Clune, 1987).

Q. Will the reforms produce major gains in work skills?

A. Probably not. See the above discussion of vocational education. The theory linking traditional academic courses to work skills is quite weak and underdeveloped. The chances that existing courses would approximate those designed for maximum impact in the workplace are very small. In other words, some of the limited impact of the reform on society is due to weaknesses in the theory of the reform itself. Powerful impacts on work skills may depend on radical redesign of academic education (Murnane, in press; Resnick, 1987).

Q. Will the reforms raise achievement scores in academic subjects?

A. Yes, probably a little. Many readers will be surprised at the bald statement about gains in achievement scores; but the only serious doubt about the occurrence of at least a small increase is the possibility that some students are not being exposed to any new material. Once it has been established that students are taking courses with new material, it follows that their achievement in skills related to those courses (e.g., math computation) will rise (Gamoran, 1987). How much they will rise, whether they will rise enough to make a difference in the workplace, and whether the new skills are more worthwhile than the ones they replaced cannot be answered by our data. We do know that greater gains in achievement and income accrue to more advanced, vs. more basic, levels of instruction (Gamoran, 1987; Jencks et al., 1979). This, together with the relatively small change in coursetaking (one or two extra basic courses), suggests quite modest gains in achievement (Levin, 1984, 1988). The small, per student magnitude of these gains must be weighed against the extensiveness of the reform. The level of skills added to society may be substantial simply because new graduation requirements produced a small gain in a great many students.

Q. Will the reforms raise dropout rates and hurt at-risk students?

A. Probably not, but there were some problems, and doubts about educational quality. As summarized above (p. 27), data on the effect of standards on dropout rates are inconclusive. Despite our respondents' views to the contrary, most available data do not show an increase in dropout rates. But concerns do exist about specific problems created by the standards and the quality of education offered to at-risk students in order to keep them in school.

Q. Did the requirements satisfy the public about the value of educational reform?

A. Yes. Our respondents in local districts and schools thought that the reforms were a success in pleasing the public. The potential bias in such claims is lessened by the generally skeptical assessments of the reforms by the respondents themselves. A high degree of political success is small confirmation of the opinion often expressed that an important function of the reform was symbolic--the need to show results in exchange for higher taxes. Graduation requirements do have some of the earmarks of loose coupling (Meyer & Rowan, 1983): highly successful communication with the political environment and highly imperfect educational results. A high degree of public support also is consistent with our finding that districts often took advantage of the new requirements to extend their own requirements and take public credit for educational improvements (Fuhrman, Clune, & Elmore, 1988).

I do not think that political success makes educational success any less likely, however. Symbolic justification is almost always easier to manage than technical results (Etzioni, 1960), so it is no surprise to see symbolism achieve a relatively higher degree of success.

Q. Were the reforms successful in communicating their purpose to the educators who implemented them?

A. No. The theory of political symbolism might gain further support from the dominant perception of our respondents that the purposes of the reforms were unclear, conflicting, or ambiguous. Most respondents could not answer whether the requirements achieved their objectives, because they did not know what the objectives were. Previously, I discussed the problem of state inaction in the development of new courses; but the problem was deeper. The state typically did not clarify what kinds of courses would best fulfil the new requirements. One simple explanation is that the reforms sought a relatively routine change in a familiar bureaucratic structure (course offerings, or labels) and did not make a sustained effort to change the core technology of schooling (for example, an attempt to produce a given increment in achievement scores).

Mandates like graduation requirements work best when the regulation contains all the information necessary for compliance (see, for example, McDonnell and Elmore's [1987] example of the "55 MPH Speed Limit"). In a superficial sense, the purpose of the reforms was obvious--increases in the number of courses with certain labels. Not obvious was the optimum degree of rigor or the best kind of courses. Improved communication about such crucial matters is one of the important issues for the next generation of reform.

POLICY RECOMMENDATIONS

My general conclusion is that the graduation requirements were set at reasonable levels and were implemented about as well as could be expected. Given the policy design, schools did about what they should have been expected to do (add the best courses they could manage on short notice for

the middle- and low-achieving students who did not previously take them). On other hand, critics are surely correct that the reforms fell far short of the ideal of academic rigor.

Basic Problems with Existing Policy

Pushing beyond the level of course labels and upgrading the level of instruction for all kinds of students is a long-term enterprise which requires many changes in policy. Against these more ambitious goals, the graduation requirements suffered from two general deficiencies: policy design and implementation.

Policy design suffered because the means and ends were not clearly related. One difficulty was the unclear relationship between academic courses and the ultimate ends of raising achievement scores and producing skills for the workplace. Math and science are reasonable guesses about what would be most useful, but the exact relationship did not seem to be investigated in any systematic way. What sort of math and science courses would be most useful for which purposes? What are the core skills for the workplace (Murnane, 1988)? What is the role of vocational education, if any? Curriculum decisions are difficult because of disagreement over the ends of schooling.[18] But, in making difficult choices, policymakers should push the decision one step further and decide what skills they are most interested in communicating.

A second difficulty was the lack of attention to instruction for different kinds of students. Given the ends of raising achievement and increasing work skills, what is the best approach with students at different achievement levels? For lower-achieving students, is it better to drill on the basics or focus on a core set of higher-order skills? How should progress and lack of progress toward ultimate ends be assessed and monitored?

Ideal answers to some of these questions will require further research, but any sort of design based upon the best available knowledge would be a considerable improvement over existing policy. Notice how the resolution of some of these questions would narrow the area of indeterminacy and help resolve some of the other questions. If we had a better idea of the central core skills, it would be possible to approach the task of remediation in a much more focussed manner.

The second major problem of policy implementation is a continuation and intensification of the problem of policy design. Schools and districts were left basically adrift on how to implement the graduation requirements. For the most part, they received no assistance in how to solve the many problems of designing and implementing a new program of instruction for different kinds of students. They coped as best they could and adapted with business-as-usual.

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[18] The debate over what to teach in school cannot even be adequately introduced in this paper. See, e.g., Brandt, (1988), Aronowitz & Giroux (1988), Gee (1988), and McLaren (1988).

Policy design is implicated in the problems of implementation because high-quality assistance may have been impossible in the absence of clear goals.

Curing these defects will require better policy design and implementation. I would make the following specific recommendations:

Streamline the Core Curriculum.

Graduation requirements are useful policy instruments, but they seem to carry the occupational hazard of overkill. We saw considerable evidence of excessive and cluttered requirements and the need to focus more attention on the core curriculum. High levels of non-specific credit requirements do not guarantee any useful educational content, interfere with valuable extra-curricular activities, and seem to result in reduction of student effort, especially late in the school day. On the other hand, certain highly specific requirements, for example, in social studies, may drive the curriculum in that area toward the lowest common denominator of instruction and cause the termination of many interesting and valuable electives. We saw nothing to convince us that much is gained from requirements beyond the core of academic subjects. A good case probably can be made for a few additional, specialized requirements (e.g., fine arts, foreign language, physical education). A quite demanding curriculum along these lines can be accommodated in a total requirement of 17 credits (for example, 4 English, 3 math, 3 science, 3 social studies, 2 foreign language, and 2 credits of physical education and fine arts). Because of the need for restraint and the importance of quality instruction, perhaps the minimum should be approached even more cautiously, and limited to the 13 credits of core courses. Beyond such a minimum level, states should seriously consider whether districts and schools are the superior decision makers about the number and content of additional courses (Clune, 1987).

Aim the Curriculum at Higher-Order Learning Objectives

The case for a streamlined core curriculum is strengthened because of the tendency of extra requirements to distract from the much more important and difficult question of the content of the core curriculum. There can be little doubt that achieving a demanding, in-depth core curriculum for all groups of students is an enormously more valuable exercise than piling on additional credit requirements and class periods for their own sake.

To reach the educational content of courses, it is necessary to go beyond general course labels and categories (like "mathematics") and focus on learning objectives. A focus on learning objectives is exactly what the alignment movement is all about (the alignment of texts, tests, and curriculum guides, see Resnick & Resnick, 1985). High school exit exams also stimulate a curriculum for lower-achieving students which is organized around test objectives.

But these policy instruments have serious flaws. The objectives of alignment are frustrated by the proliferation of courses allowed in high schools (e.g., many levels and kinds of mathematics). While the content of each course is regulated, there is no common core curriculum guaranteeing a quality

education for all students. Some kinds of aligned curriculum, and certainly the typical high school exit exam, emphasize lower- rather than higher-order cognitive skills. One practical step is to borrow from states like California which are taking the lead in developing higher-order learning objectives and corresponding standardized tests.

Thus, in addition to emphasizing learning objectives rather than course labels, states need to upgrade the level of the learning objectives, and couple both efforts with a simplified and streamlined core curriculum which is as demanding as possible for all groups of students.

Pay Special Attention to Instruction for Middle- and Low-Achieving Students

The task of developing a demanding core curriculum emphasizing higher-order skills for middle and low achievers is a difficult one; and this task clearly should be isolated for distinct and intensive analysis.

The obstacles to a high-quality curriculum for such students are numerous. Watered down course content may be insufficiently challenging and engaging. Remedial education, driven by standardized tests, may emphasize the lowest-level and least interesting skills. Some alternatives to regular high school (e.g., special schools, night school) may represent massive exercises in reduced expectations. Many teachers and administrators have unnecessarily low expectations for students based upon previous achievement.

On the other hand, high levels of course content for low achievers is a demanding goal. Policymakers should design a systematic approach to the problem of remediation for students at widely differing levels of initial learning. Ways must be found to identify the most important part of the core curriculum (the core of the core, so to speak), and to make sure students reach at least that level. States, districts and schools need to design workable paths from remedial and weak courses to more demanding ones. (California's bridge courses are a simple example.)

Some aspects of the task of upgrading education for low-achieving students are not amenable to immediate solution, and some will require further research. Eventually, changes probably will be required in the attitudes of school personnel and the structure of education in elementary and middle school. The central point here is that the enterprise should not be left to chance or drift (in the form of vague subject matter requirements or misguided remedial tests). Instead, the whole issue should be pulled out for concentrated attention and analysis. The counterpart to such special attention at the policy level is technical assistance for school planning discussed below.

Use Different Policy Instruments for Different Purposes and Groups of Students

The need to focus on middle- and low-achieving students and the policies which affect them is only a special case of a broader issue--the need to think

of multiple policies as they affect different groups of students. Minimum graduation requirements affect lower-achieving students because these are the students below the minimum. College-bound students are not affected because university entrance requirements already exceeded the new state minimum. The impact of the minimum requirements on low-achieving students is shaped because of slack in the requirements, preexisting expectations, the tendency to water down courses, alternative routes, preexisting high school exit exams, and so on.

A similar picture can be drawn for academically oriented students who are most affected by university entrance requirements, traditional conceptions of academic subjects, and the structure of advanced placement exams (which also are sometimes criticized for excessive emphasis on factual knowledge and course coverage rather than higher-order thinking and problem solving). Some evidence suggests that the coursetaking and achievement of so-called middle students are most strongly affected by changes in the entrance requirements of the lower rung of state universities (the state system vs. the university system).

Thus, the idea of a "uniform standard" affecting everyone in the same way is not realistic. Policymakers should be aware that different groups of students are affected by different combinations of policy instruments in different ways. It follows that policy design should proceed by developing an accurate picture of the kind of students and schools that will be most affected by groups of policies and design the policies to fit those needs.

Investigate Cognitively Demanding Vocational Education

Evidence from the field and common sense suggest that vocational courses can be excellent ways of motivating students; experience suggests that vocational tasks can be cognitively demanding (Resnick, 1987). A recent paper discussed above finds economic benefits to the non-college bound from vocational courses (Kang & Bishop, 1988). Some of the more promising approaches to higher expectations for low-achieving students involve basic education oriented toward occupational settings (Wehlage, Rutter, Smith, Lesko, & Fernandez, forthcoming). The idea of cognitively skilled vocational workers is in many ways exactly what the reform movement was aiming for, especially for the kind of students who were most affected (middle and low achievers). (See Hamilton, 1984; and the above reference to A Nation at Risk.) It is, thus, a minor irony that vocational courses were the main casualty of the reform. Traditional vocational courses have been criticized for failing to be interesting, demanding or even vocationally relevant (Grubb, 1984); but Kang and Bishop (1988) cite improvements in vocational education during the 1970s as a reason for recently emerging economic benefits.

Thus, an important question for the next generation of reform is whether to strive for a better melding of the core curriculum, training in higher-order thinking, and vocational education. The answer to this question, and the related one of how much to rely on the traditional vocational education establishment, are beyond the scope of this research.

Design Technical Assistance to Schools for Improved Content

It became very clear from our research that, regardless of the quality of state policies, schools play a vital role in determining the course content which is available to students. Schools serve very different kinds of students and face widely differing problems and circumstances. Schools must put together a package of courses which fits their particular educational philosophy, student body, teaching faculty, school counsellors, and so on. For example, one school in our sample decided to satisfy an English requirement by offering double sessions of English as a Second Language to newly arrived Haitian students and to offer such students American rather than ancient history because of the students' urgent need to become familiar with American society. The same school had developed an aggressive program of placing low-achieving students in traditional academic courses, an approach notably lacking in most of the schools we visited.

In order to recognize and exploit this local variation, and encourage local problem solving, states should make technical assistance to schools for schoolwide planning of curriculum a part of any set of redesigned policies. Teams of state experts might help schools through problems of local design and implementation. Technical assistance should encourage the kind of schoolwide planning needed to fashion integrated solutions (e.g., sequences of courses).

Technical assistance also should be prepared to deal with teacher training. Teacher training must be more carefully designed and sustained the greater the departures required from traditional practice (e.g., novel short cuts through traditional materials for low-achieving students).

Build an Indicator System to Track Content and Course-Related Achievement

The impact of multiple policies on different groups of students in different schools is difficult to assess, yet the information is needed on a regular basis to allow for adjustments and refinements. It is a remarkable fact that very few states can track coursetaking by course labels, no state has the ability to track the content of courses beyond course labels (see McDonnell, 1988), and few can monitor the achievement of students in the subject matter actually taught. Standardized achievement tests bear only a weak relationship to specific course content; but the standardized subject matter exams which do focus on course content are becoming popular as part of alignment in many states and districts.

Thus, policymakers should consider designing and implementing an indicator system to track changes in proximate and ultimate goals (for example, coursetaking, course content, and specified kinds of achievement). They should consider as well, a design which is sensitive to outcomes after high school (e.g., selected tracking of students).

Continue Research on Curriculum Improvement

The policy recommendations made above--even those which are immediately feasible--represent a quantum increase in sophistication and effort over existing policy. But more profound change is possible and, in the end, probably necessary, to achieve the ultimate goals desired (e.g., major gains in worker productivity). The primary requirement is more basic research. Some of the information which would be useful includes answers to these questions:

- What really are the core skills of a skilled worker which can be imparted by schooling, and which kinds of courses are best suited to impart them? If the skills are relatively narrow, e.g., multi-step problem solving (Murnane, 1988), the curriculum should be redesigned to bear down on these skills and make sure every student gets them. The narrowness of the skills could be a great advantage for teaching low-achieving students, compared to a vague and time-consuming requirement like "three credits in mathematics."

- What are the benefits and costs of vocational education; how can these courses be made cognitively demanding; and what is the best combination of vocational and academic education?

- What are the best methods of teaching higher-order skills to low achieving students? If it is best to skip some fundamental skills and proceed to a selection of higher-order skills, which fundamental skills should be deemphasized and which higher-order skills are essential? If the higher-order skills present special difficulties, what is the best approach to teaching them?

- How could we redesign the entire elementary and high school curriculum to teach the highest levels of skills possible for all students? At least in math and science, our existing curriculum has several outstanding problems: it is repetitious, it is not based on a clear model of skills, it is not cumulative, and it confines low-achieving students to learning lower-order skills (Raizen, 1988; Romberg, 1988; Shepard & Smith, 1988; Slavin, 1987).

Evaluate Changes in the Policymaking Process

All of the policy recommendations discussed above have in common the goal of educational policy which is more coherent, instrumentally goal-directed, analytical, and data based (in short, more "rational"). Unfortunately, obstacles to greater rationality are built into the process of policymaking, and special efforts must be undertaken to overcome these obstacles.

A case can be made, for example, that the precise degree of rationality embodied in the recent wave of high school graduation requirements is a fairly typical occurrence. Policymakers had quite different goals for educational reform. For example, besides producing a more rigorous education, their goals may have included obtaining higher funding for education, symbolically satisfying public demands for accountability, punishing the educational

establishment and reforming local governance of schools (Fuhrman, Clune & Elmore, 1988). Even among those interested in technical goal achievement, conflicts exist about the proper ends of schooling (for example, higher-order thinking vs. back to the basics). Paradoxically, the decentralized, bureaucratized system of educational governance in the United States may produce an exceptionally "busy," overgoverned, and uncoordinated policymaking process (Boyd, 1979; Cohen, 1982).

In contrast, the development of a long-range, multi-part strategy for school improvement assumes continuity of educational planning over cycles of political elections and issue salience. Under these circumstances, it was perhaps understandable that policymakers reached agreement on a set of minimum course labels and stopped short of tackling the harder problems of actual course content for different groups of students.

Obviously, much depends on one's assessment of the degree to which policymaking is capable of higher levels of instrumental rationality (one's optimism or pessimism about policy, as it were). High levels of pessimism would seem to point strongly toward a minimal state role and heavy reliance on curriculum development by local districts and even schools. In favor of optimism is the fact that certain states (such as South Carolina and California) have succeeded in achieving much higher levels of coordinated and sustained planning and implementation than others.

The elements of such success are beyond the scope of this paper but seem to include two primary activities: first, a network of influential people inside and outside government (public officials, private citizens, and civic institutions) prepared to stick with educational planning over the long haul, spanning political campaigns and issue cycles. Second, in order to be effective, this group of policymakers is likely to need data and data analysis adequate to the increased level of technical demand on policy.

In other words, what may be needed is a marriage of stable political influence and sophisticated technical capacity. The most fundamental point is that states desiring educational policy improvements may need to improve the policymaking process in order to get them. In effect, a full-service curriculum policy of the type outlined in this paper requires a full-service policy and delivery system.

CONCLUSION: AMBITIOUS GOALS, MORE PRECISE POLICY

In a basic sense, the ultimate verdict about the success of graduation requirements does not end with an assessment of results measured against historical expectations. However one reads those results, there is room to say that the reforms succeeded and failed. They succeeded in getting a lot more students into basic academic courses and in satisfying a concerned public; they failed in getting students into the most rigorous possible courses, in producing a reasonably uniform education for all students and, probably, in conveying the higher-order skills necessary for a competitive economy.

Whether or not to be satisfied with these results is not just a scientific question for researchers but a political question for current policymakers. Research can say that there is plenty of room and need for improvement, and that considerable improvement (somewhere below the frontier of ideal results) seems feasible. The larger society must decide whether the task is worth the effort. Our sense as researchers is that the first wave of reform barely began an important enterprise that is well worth pursuing.

The political and organizational difficulties of creating and sustaining the kind of curriculum policy recommended in this paper (one which is more coherent and ambitious about learning objectives for all groups of students) are formidable. The ideal would be maximum restraint about the ambitious objectives which are established--a demanding, but also somehow minimalist, curriculum. Ideas presented earlier in the paper about a streamlined core and a highly focussed set of higher-order learning objectives may be useful guidelines in keeping demands manageable. Given restraint about the number of requirements, additional aspects of policy development can be approached incrementally. Following the lead of states like California and Connecticut, policymakers could develop and implement higher-order skills assessments one subject matter at a time (e.g., 8th grade social studies). Finally, as part of this simultaneous strategy of ambition and restraint, states also should work hard on the unglamorous, usually neglected task of deregulation--getting rid of unnecessary, cumbersome guidelines and testing at the same time that more coherent, ambitious, streamlined instruments are being developed.

An important issue not addressed by this paper is the most desirable blend of centralized curriculum policy, local control, and teacher professionalism. That issue will be addressed by future CPRE research.[19] Earlier discussion raised the possibility of a possible "San Andreas Fault" between curriculum centralization and various decentralizing movements (Clune, 1987). The best bet for the moment is that a streamlined core curriculum aimed at higher-order thinking will complement rather than conflict with desirable local discretion and teacher professionalism (Smith & O'Day, forthcoming).

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[19] CPRE has research in progress on the effects of different types of curriculum control systems on content coverage, teacher morale and sense of effectiveness.

TABLE 1

HIGH SCHOOL GRADUATION REQUIREMENTS[a]

Total # of Required Credits (PRIOR)	Total # of Required Credits (NEW)	Effective Date of New Require-ments	Change in Total # of Required Credits (CHANGE)	Requirements[b] in Core Subjects				Graduation Rate (1986)		Achievement Test Data (1987)	Exit Exam		
				Subject[c]	Prior	New	Change	Rate	Rank[d]	Rank[e,f]	Yes	Year	No
ALABAMA													
20	22	1989	2	English	4	4	0	67.3	39[t]	21[t,e]	X	1985	
				Math	2	2	0						
				Science	1	2	1						
				Social Studies	3	3	0						
				CORE	10	11	1						
				OTHER	10	11							
				TOTAL	20	22							
ALASKA													
19	21	1985	2	English	1	4	3	68.3	36	19[e]			X
				Math	1	2	1						
				Science	1	2	1						
				Social Studies	1	3	2						
				CORE	4	11	7						
				OTHER	15	10							
				TOTAL	19	21							
ARIZONA													
18	20	1987	2	English	3	4	1	63.0	47	9[t,e]	X	1976	
				Math	1	2	1						
				Science	1	2	1						
				Social Studies	2.5	2.5	0						
				CORE	7.5	10.5							
				OTHER	10.5	9.5							
				TOTAL	18	20							
ARKANSAS													
16	20	1988	4	English	4	4		78.0	15	24[e]			X
				Math	-	3[1]	3						
				Science	-	2[1]	2						
				Social Studies	1	3	2						
				CORE	5	12	7						
				OTHER	11	8							
				TOTAL	16	20							

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Center for Policy Research in Education

HIGH SCHOOL GRADUATION REQUIREMENTS[a]

Total # of Required Credits (PRIOR)	Total # of Required Credits (NEW)	Effective Date of New Requirements	Change in Total # of Required Credits (CHANGE)	Requirements[b] in Core Subjects				Graduation Rate (1986)		Achievement Test Data (1987)	Exit Exam		
				Subject[c]	Prior	New	Change	Rate	Rank[d]	Rank[e,f]	Yes	Year	No
CALIFORNIA													
L.O.	13	1987	13	English	L.O..	3	3	66.7	41	9[f]	X[2]	1979	
				Math		2	2						
				Science		2	2						
				Social Studies		3	3						
				CORE		10	10						
				OTHER		3							
				TOTAL		13							
COLORADO													
Local district sets number and type of courses, competencies required for graduation.				English				73.1	28	4[t,e]			
				Math									
				Science									
				Social Studies									
				CORE									
				OTHER									
				TOTAL									
CONNECTICUT													
18[3]	20	1988	2	English		4		89.8	2	5[f]			X
				Math		3							
				Science		2							
				Social Studies		3							
				CORE		12							
				OTHER		8							
				TOTAL	18	20							
DELAWARE													
18	19	1987	1	English	4	4		70.7	33	6[f]	X[2]	1981	
				Math	1	2	1						
				Science	1	2	1						
				Social Studies	3	3							
				CORE	9	11	2						
				OTHER	9	8							
				TOTAL	18	19							

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				Subject[c]	Prior	New	Change	Rate	Rank[d]	Rank[e,f]	Yes	Year	No
FLORIDA													
Local option	24[4]	1987	24	English	Local option	4	4	62.0	50	13[f]	X	1983	
				Math		3	3						
				Science		3	3						
				Social Studies		3	3						
				CORE		13	13						
				OTHER		11							
				TOTAL		24							
GEORGIA													
20	21	1988	1	English	3	4	1	62.7	48[t]	20[f]	X	1985	
				Math	2[5]	2+(1)[6]	(1)[6]						
				Science	1[5]	1+(1)	(1)[6]						
				Social Studies	3.3	3.0	0						
				CORE	9.3	11.0	2						
				OTHER	10.7	10							
				TOTAL	20	21							
HAWAII													
18	20	1983	2	English	4	4		70.8	32	16[f]	X	1983	
				Math	1	2	1						
				Science	1	2	1						
				Social Studies	4	4							
				CORE	10	12	2						
				OTHER	8	8							
				TOTAL	18	20							
IDAHO													
18	21	1988	3	English	3.5	5.0	1.5	79.0	13	14[e]	X	1982	
				Math	1.0	2.0	(1.0)[7]						
				Science	2.0	2.0							
				Social Studies	2.0	3.5	0.5						
				CORE	8.5	12.5	3.0						
				OTHER	9.5	8.5							
				TOTAL	18	21							

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				Subject[c]	Prior	New	Change	Rate	Rank[d]	Rank[e,f]	Yes	Year	No
ILLINOIS													
16	16	1988	0	English	3	3		75.8	21	15[f,e]			X
				Math		2	2						
				Science		1	1						
				Social Studies	1	2	1						
				CORE	4	8	4						
				OTHER	12	8							
				TOTAL	16	16							
INDIANA													
16	19	1989	3	English	3	4[g]	1	71.7	30	18[f]			X
				Math	1	2	1						
				Science	1	2	1						
				Social Studies	2	2							
				CORE	7	10	3						
				OTHER	9	9							
				TOTAL	16	19							
IOWA													
Number and types of courses required for graduation determined by local board				English				87.5	5	2[e]			X
				Math									
				Science									
				Social Studies		1.5							
				CORE									
				OTHER									
				TOTAL									
KANSAS													
17	20	1988	3	English	4	4		81.5	8[t]	9[t,e]			X
	21	1989	4	Math	1	2	1						
				Science	1	2	1						
				Social Studies	2	3	1						
				CORE	8	11	3						
				OTHER	9	10							
				TOTAL	17	21							

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Total # of Required Credits (PRIOR)	Total # of Required Credits (NEW)	Effective Date of New Require-ments	Change in Total # of Required Credits (CHANGE)	Requirements[b] in Core Subjects				Gradua-tion Rate (1986)		Achieve-ment Test Data (1987)	Exit Exam		
				Subject[c]	Prior	New	Change	Rate	Rank[d]	Rank[e,f]	Yes	Year	No
KENTUCKY													
18	20	1987	2	English Math Science Social Studies CORE OTHER TOTAL	3 2 2 4 11 7 18	4 3 2 2 11 9 20	1 1 0 -2 0	68.6	35	20[e]			X
LOUISIANA													
20	23	1989	3	English Math Science Social Studies CORE OTHER TOTAL	3 2 2 2 9 11 20	4 3 3 3 13 10 23	1 1 1 1 4	62.7	48[t]	27[e]			X
MAINE													
Determined by local boards; only state requirement is 4 years of English	16	1989	16	English Math Science Social Studies CORE OTHER TOTAL	4	4 2 2 3 11 5 16		76.5	20	10[f]			X
MARYLAND													
20	20	1989	(see [9])	English Math Science Social Studies CORE OTHER TOTAL	4 3 2 3 12 8 20	4 3 2 3 12 8 20	(see [9])	76.6	19	3[t,e]	X	1982	

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				Subject[c]	Prior	New	Change	Rate	Rank[d]	Rank[e,f]	Yes	Year	No
MASSACHUSETTS													
Requirements set by local board				English Math Science Social Studies CORE OTHER TOTAL				76.7	18	7[f]			X
MICHIGAN													
Requirements set by local board except for a single course in Civics				English Math Science Social Studies CORE OTHER TOTAL	.5			67.8	37	17[t,e]			X
MINNESOTA													
	20[10]	Current		English Math Science Social Studies CORE OTHER TOTAL		4 1 1 3 9 11 20		91.4	1	3[e]			X
MISSISSIPPI													
Local option	18	1989	18	English Math Science Social Studies CORE OTHER TOTAL	Local option	4 2 2 2 10 8 18		63.3	46	28[e]	X	1987	

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Total # of Required Credits (PRIOR)	Total # of Required Credits (NEW)	Effective Date of New Requirements	Change in Total # of Required Credits (CHANGE)	Requirements[b] in Core Subjects				Graduation Rate (1986)		Achievement Test Data (1987)	Exit Exam		
				Subject[c]	Prior	New	Change	Rate	Rank[d]	Rank[e,f]	Yes	Year	No
MISSOURI													
20	22	1988	2	English Math Science Social Studies CORE OTHER TOTAL	1 1 1 1 4[11] 16 20	3 2 2 2 9 13 22	2 1 1 1 5	75.6	22	12[e]			X[12,13]
MONTANA													
16	20	1986	4	English Math Science Social Studies CORE OTHER TOTAL	4 2 2 2 10 6 16	4 2 1 2 9 11 20[14]	-1 -1	87.2	6	4[t,e]			X
NEBRASKA													
160 credit hours	200 credit hours	1991	40 credit hours	English Math Science Social Studies CORE OTHER TOTAL	Local options	160 hrs. of core subjects to be determined by local board		88.1	4	7[e]			X
NEVADA													
19	22.5	1992	3.5	English Math Science Social Studies CORE OTHER TOTAL	3 1 1 2 7 12 19	4 2 2 2 10 12.5 22.5	1[15] 1 1 3	65.2	42	13[e]	X	1982	

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Total # of Required Credits (PRIOR)	Total # of Required Credits (NEW)	Effective Date of New Require-ments	Change in Total # of Required Credits (CHANGE)	Requirements[b] in Core Subjects				Graduation Rate (1986)		Achievement Test Data (1987)	Exit Exam		
				Subject[c]	Prior	New	Change	Rate	Rank[d]	Rank[e,f]	Yes	Year	No
NEW HAMPSHIRE													
16	19.75	1989	3.75	English Math Science Social Studies CORE OTHER TOTAL	4 1 1 2 8 8 16	4 2 2 2.5 10.5 9.25 19.75	 1 1 .5 2.5 	73.3	27	1[f]			X
NEW JERSEY													
18	22	1992		English Math Science Social Studies CORE OTHER TOTAL	 2 2 8 10 18	4 3 2 3 12 10 22	 1 2 1 4 	77.6	16[t]	14[f]	X	1985	
NEW MEXICO													
21	23[16]	1990	N.D.	English Math Science Social Studies CORE OTHER TOTAL	4 2 2 2 10 11 21	5 3 2 3 13 10 23	1 1 1 3 -1 	72.3	29	21[t,e]	X	1981	
NEW YORK													
16	18.5	1989	2.5	English Math Science Social Studies CORE OTHER TOTAL	4 1 1 3 9 7 16	4 2 2 4 12 6.5 18.5	 1 1 1 3 	64.2	45	12[e]	X	1979	

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				Subject[c]	Prior	New	Change	Rate	Rank[d]	Rank[e,f]	Yes	Year	No
NORTH CAROLINA													
18	20	1987	2	English	4	4		70.0	34	21[f]	X	1980	
				Math	2	2							
				Science	2	2							
				Social Studies	2	2							
				CORE	10	10							
				OTHER	8	10							
				TOTAL	18	20							
NORTH DAKOTA													
17	17[17]	1984	0	English	4	4		89.7	3	17[f,e]			X
				Math	2	2							
				Science	2	2							
				Social Studies	3[18]	3							
				CORE	11	11							
				OTHER	6	6							
				TOTAL	17	17							
OHIO													
17	18[19]	1987	1	English	3	3		80.4	11	9[e]	X	1990	
				Math	1	2	1						
				Science	1	1							
				Social Studies	2	2							
				CORE	7	8							
				OTHER	10	10							
				TOTAL	17	18							
OKLAHOMA													
18	20	1987	2	English	4	4		71.6	31	25[e]			X
				Math	1	2	1						
				Science	1	2	1						
				Social Studies	1.5	2	.5						
				CORE	7.5	10							
				OTHER	10.5	10							
				TOTAL	18	20							

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				Subject[c]	Prior	New	Change	Rate	Rank[d]	Rank[e,f]	Yes	Year	No
OREGON													
21	22[20]	1988	1	English	3	3		74.1	25	2[f]	X	1978	
				Math	1	2	1						
				Science	1	2	1						
				Social Studies	3.5	3.5							
				CORE	8.5	10.5	2						
				OTHER	12.5	11.5							
				TOTAL	21	22							
PENNSYLVANIA													
13[21]	21[21]	1989	8	English	3	4	1	78.5	14	15[f]			X
				Math	1	3	2						
				Science	1	3	2						
				Social Studies	2	3	1						
				CORE	7	13	6						
				OTHER	6	8							
				TOTAL	13	21							
RHODE ISLAND													
16	16	1989	0	English	4	4		67.3	39[t]	11[f]			X
				Math	1	2	1						
				Science	1	2	1						
				Social Studies	1	2	1						
				CORE	7	10	3						
				OTHER	9	6							
				TOTAL	16	16							
SOUTH CAROLINA													
18	20	1987	2	English	4	4		64.5	43	22[f]	X	1990	
				Math	2	3[22]	1						
				Science	1	2	1						
				Social Studies	3	3							
				CORE	10	12	2						
				OTHER	8	8							
				TOTAL	18	20							

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				Subject[c]	Prior	New	Change	Rate	Rank[d]	Rank[e,f]	Yes	Year	No
SOUTH DAKOTA													
16	18 19 20	1987 1988 1989	2 3 4	English Math Science Social Studies CORE OTHER TOTAL	4 1 1 2 8 8 16	4 2 2 3 11 9 20[23]	 1 1 1 3 	81.5	8[t]	8[e]			X
TENNESSEE													
18	20	1987	2	English Math Science Social Studies CORE OTHER TOTAL	4 1 1 1.5 7.5 10.5 18	4 2 2 1.5 9.5 10.5 20	 1 1 2 	67.4	38	21[t,e]	X	1982	
TEXAS													
18	21	1988	3	English Math Science Social Studies CORE OTHER TOTAL	3 2 2 2.5 9.5 8.5 18	4 3 2 3 12 9 21	1 1 .5 2.5 	64.3	44	17[f]	X	1987	
UTAH													
15	24	1989	9	English Math Science Social Studies CORE OTHER TOTAL	3 1 1 2 7 8 15	3 2 2 3 10 14 24	 1 1 1 3 	80.3	12	15[t,e]	X	1988	

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				Subject[c]	Prior	New	Change	Rate	Rank[d]	Rank[e,f]	Yes	Year	No
VERMONT													
15.5	14.5	1989	-1	English	4	4		77.6	16[t]	3[t,f]	X	1981	
				Math	1	3[24]	2						
				Science	1	2[24]	1						
				Social Studies	2	3	1						
				CORE	8	12	4						
				OTHER	7.5	2.5							
				TOTAL	15.5	14.5							
VIRGINIA													
18	20	1989	2	English	4	4		73.9	26	8[f]	X	1981	
				Math	1	2(3)[25]	1(1)[25]						
				Science	1	or 2(3)[25]	or 1(1)[25]						
				Social Studies	3	3	3						
				CORE	9	12							
				OTHER	9	8							
				TOTAL	18	20							
WASHINGTON													
15	16	1989	1	English	2	3	1	75.2	23[t]	N.D.[27]			X
	18[26]	1990[26]	3	Math	1	2	1						
	19	1991	4	Science	.66	2	1.33						
				Social Studies	1.66	2.5	1						
				CORE	5.32	9.5	4.33						
				OTHER	9.68	9.5							
				TOTAL	15	19							
WEST VIRGINIA													
17	21	1989	4	English	4	4		75.2	23[t]	26[e]			X
				Math	1	2	1						
				Science	1	2	1						
				Social Studies	3	3							
				CORE	9	11	2						
				OTHER	8	10							
				TOTAL	17	21							

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				Subject[c]	Prior	New	Change	Rate	Rank[d]	Rank[e,f]	Yes	Year	No
WISCONSIN													
Local option	13	1989	13	English Math Science Social Studies CORE OTHER TOTAL	Local option	4 2 2 3 11 2 13		86.3	7	1[e]			X
WYOMING													
	18[28]	Current	0	English Math Science Social Studies CORE OTHER TOTAL	(4)[28] (2) (2) (3) 18	Local option, must include 1 year of social studies		81.2	10	4[t,e]			X

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Notes Pertaining to High School Graduation Requirements Table

a: Data Sources

Columns 1-8: Belsches-Simmons, G., Flakus-Mosqueda, P., Lindner, B., & Mayer, K. (1987, March). "Recent state educational reform: Initial teacher certification, teacher compensation and high school graduation requirements." Denver, CO: Education Commission of the States.

Education Commission of the States. (1987, August). "Minimum high school graduation course requirements." Denver, CO: Author.

Goertz, M. E. (1988). "State educational standards: A 50-state survey." Princeton, NJ: Educational Testing Service.

National Center for Education Statistics. (1988). "The condition of education: Elementary and secondary education." Washington, DC: U.S. Department of Education.

Columns 9-13: U. S. Department of Education. (1988, February). "State education statistics." Washington, DC: Author, Office of Planning, Budget and Evaluation.

b: Requirements are defined as the necessary prerequisites for a standard high school diploma.

c: Social studies includes courses such as American History, Civics, Economics, state history, etc. English includes language arts, communication skills, etc.

d: Rank includes District of columbia in 51st place.

e: Rank and percentile among the 28 states administering the ACT.

f: Rank and percentile among the 22 states administering the SAT (includes District of Columbia in 19th place).

t: Tied for rank with another state.

N.D.: No Data given.

L.O.: Local Option: Requirements set by local board.

Footnotes for High School Graduation Requirements Table

1 In Arkansas ECS reports 5 units of math and science; at least 2 in both subjects.

2 Local district sets performance competencies for graduation in California and Delaware.

3 Prior to the requirement of 20 credits in Connecticut, 18 credits were required but there were no subject area requirements.

4 Florida phased in credit requirements by moving from no state specifications in 1983 to 22 required credits in 1985 and 1986 to 24 required in 1989.

5 Georgia requires either 2 math and 1 science or the reverse.

6 ETS reports that Georgia requires one year of math or science.

7 Idaho requires an additional year of math or computer science.

8 Indiana allows a 3rd year of foreign language as a substitute for 1 year of English.

9 In Maryland the number of credits remained the same but in 1989, content specific changes were made within the 20 credits. U.S. History was specified along with I credit for arts and 1 credit for industrial arts, home ec. vocational education or computer studies.

10 Minnesota's graduation requirement of 20 credits was in effect prior to the reform movement.

11 Missouri requires 2 additional years from among core subjects.

12 Since 1987, Missouri students have to pass the Basic Essential Skills Test (BEST) to receive credit for 9th grade basic skills courses.

13 Missouri students must pass "an examination on the provisions and principles of the constitution of the U.S. and of the state of Missouri, and in American history and American constitutions. The State Commissioner of Education is required to oversee compliance with this provision and prescribe a list of suitable tests adapted to the needs of the particular school grades. The failure of any superintendent, principal, or teacher to observe and carry out this requirement is sufficient for termination of contract (ECS, p. 184).

14 Montana's total requirements were 16 before 1988; 18 after 1988; 20 in 1989.

15 Nevada students who fail 9th grade Nevada HIgh School Proficiency Exam are required to take an additional year of math or English.

16 New Mexico legislature requires all students who entered high school in September, 1986 and beyond to complete 23 units for graduation, but the SDE standards require only 21.

17 Since 1983 the Superintendent of Public Instruction in North Dakota has required 17 total units for graduation. However, in order for any high school to be accredited by the SDE, it must offer to each student at least once during each four year period: 3 units of English, 3 units of math, 4 units of science, 3 units of social studies, 1 unit of health and p.e., 1 unit of music, and 6 elective units in any combination of the following areas: business education, economics and the free enterprise system, foreign language, industrial arts and any variation of vocational education - this may result in a total of 22 credits, with at least 14 in core subject areas as defined in this work. Four units is considered the minimum number of units in which any student may enroll.

18 Effective 1986, North Dakota social studies requirements must include 1 credit each in world history and U. S. history.

19 In addition to the English requirement, Ohio students must complete 3 units in one subject.

20 Oregon districts have the option to increase any requirements.

21 In 1989, Pennsylvania students must complete 13 credits in the last 3 years of high school; in 1989, they must complete 21 credits in 4 years.

22 South Carolina's requirement of 3 credits in math may include 1 credit of computer science.

23 South Dakota added 1 year each in math and science in 1987 and will add one year in social studies in 1989.

24 Vermont requires a total of 5 credits in math and science.

25 In 1988, Virginia students must complete an additional year of either math or science beyond the two credits in each required by state.

26 In 1992, Washington will require 19 credits, an addition of one in either fine, visual or performing arts.

27 Washington is neither an ACT or SAT state since it administers its own test. Consequently, the percentage of ACT and SAT test takers is low and not reported here.

28 Wyoming requirements have been in effect for several years. Parentheses frame offerings required by state for school accreditation. Local boards determine remaining requirements to reach total of 18 credits.

TABLE 2

CHANGES IN COURSETAKING IN FOUR STATES, 13 DISTRICTS AND 19 HIGH SCHOOLS

ARIZONA (requires 4 English, 2 math, 2 science, 2.5 social studies; English, math, and science are +1 each compared to former requirements)

District #1 (affluent, 83% white)

1. High school (affluent, 100% white)

Sections: added 5 sections math
added 8 sections world geography
Courses: added world geography course
added general math course

District #2 (urban, 50% white)

2. High school (affluent, 75% white)

Sections: added 6 sections math
added 5 sections world geography
Courses: added second year of remedial course in algebra
reduced industrial arts, home economics, physical education, and performing arts electives

3. High school (15% white)

Sections: added 12-14 sections world geography
added consumer math sections
Courses: added honors biology
dropped 1 semester Arizona history, earth science

4. High school (working class, 53% white)

Sections: added 8 sections world geography
added 10 sections lower-level science
added 3-4 sections math
Courses: no courses added

TABLE 2 (continued)

CHANGES IN COURSETAKING IN FOUR STATES, 13 DISTRICTS AND 19 HIGH SCHOOLS

CALIFORNIA (requires 3 English, 2 math, 2 science, 3 social studies; all new state requirements)

District #1 (suburban, 90% white)

District's total required credits exceeded state's added economics course and extra science sections reduced electives.

(no schools visited)

District # 2 (urban, 19% white)

5. High school (urban, predominantly minority)

Sections: added 6 sections math
added 6-8 sections physical science
added 6 sections English
Courses: reduced electives, e.g. art

6. High school (urban, 15% white)

Sections: added 12 sections economics
added 9 sections lower-level physical science
added 6-7 sections chemistry
added 4-5 sections physics
dropped 10 sections art and home economics
Courses: no courses added

7. High school (urban, 67% white)

Sections: added science sections for non-college bound
Courses: added physical science course
added economics course
dropped electives (e.g. California history & constitutional law)

TABLE 2 (continued)

CHANGES IN COURSETAKING IN FOUR STATES, 13 DISTRICTS AND 19 HIGH SCHOOLS

District # 3 (urban, 51% white)

8. High school (56% white)

Sections: added 3 sections science
added 3 sections consumer math and algebra
Courses: reduced electives (e.g. metal shop and physical education)

9. High school (56% white)

Sections: added 6 sections science
added lower-level math sections
Courses: added 9th grade survey course
reduced electives (e.g. art, music, business, home economics)

District # 4 (urban, 85% white)

10. High school (85% white)

Sections: added 3-4 sections math
added 3-4 sections science
Courses: added natural sciences 1 & 2 (for non-college bound)
added economics course

FLORIDA (requires 4 English, 3 math, 3 science, 3 social studies; previous requirements were based on local options)

District # 1 (urban, 25% white)

District requirements equalled or exceeded state's except in science; added 500 sections of science districtwide to meet new requirement (an average of 17 sections for each of 28 high schools). Sections of other subjects were added because of the need to meet preexisting requirements in the face of rapid enrollment increases.

11. High school (urban, inner-city, 2% white)

Sections: added science sections
added world history sections
added math sections
Courses: added world history course
added physical science course in 9th grade

TABLE 2 (continued)

CHANGES IN COURSETAKING IN FOUR STATES, 13 DISTRICTS AND 19 HIGH SCHOOLS

12. High school (inner-city, 22% white)

Sections: added science sections
added math sections
Courses: added practical arts, science, fine arts, life management, 4th year math

13. High school (urban, 15% white)

Courses: added remedial math course
Sections: added 8-10 science sections

14. High school (urban, 34% white)

Sections: added math sections (including geometry and algebra)
added 8 computer literacy sections
Courses: added remedial classes in math
added world history course
physical science dropped to junior high
reductions in electives, vocational education, foreign languages

District # 2 (urban, 72% white)

District added 140 sections in social studies, math, science, and English (an average of 10.8 sections in all these subjects in each of 13 high schools)
Changed math titles

1 high school was visited, but district figures on course changes are more precise than high school respondents' estimates.

District #3 (small city, 76% white)

District already exceeded state's requirements in all subjects.

TABLE 2 (continued)

CHANGES IN COURSETAKING IN FOUR STATES, 13 DISTRICTS AND 19 HIGH SCHOOLS

PENNSYLVANIA (requires 4 English, 3 math, 3 science, 3 social studies; English and social studies are +1 each and math and science are +2 each compared to former requirements)

District #1 (affluent, suburban, 98% white)

District already exceeded state's requirements

(no schools visited)

District #2 (small city, 95% white)

15. High school (95% white)

Sections: added 1 section general math in 9th grade
added 1 section general science
added 1 section general biology
dropped environment science
Courses: no courses added

District #3 (urban, 25% white)

16. High school (inner-city, 65% white)

Sections: no sections added
Courses: added third year math
reduced business and home economics

17. High school (inner city, 1% white)

Sections: added 5 sections math
added 2-3 sections science
Courses: added math applications for third year non-academics
added third year science course

18. High school (inner-city vocational school, 1% white)

Sections: added math sections
Courses: added science course

TABLE 2 (continued)

CHANGES IN COURSETAKING IN FOUR STATES, 13 DISTRICTS AND 19 HIGH SCHOOLS

District #4 (suburban, 98% white)

District exceeded state's requirements in all subjects; made biology mandatory in 8th grade

19. Combination Middle school and high school (suburban, 98% white)

Sections: added 1 section biology
added 1 section physical science
reduced voc tech and business
Courses: no courses added

TABLE 3

DISTRICT AND SCHOOL RESPONDENTS' VIEWS ABOUT EFFECTS OF NEW GRADUATION REQUIREMENTS

Type of Response	# of States*	# of Districts*	# of Schools*
ADVANTAGES:			
1. raised test scores	2	3	5
2. better college preparation	3	9	13
3. better employment preparation	2	3	2
4. improved quality of instruction	3	3	5
5. provided students with more basic skills (broader background)	3	3	4
DISADVANTAGES			
1. delayed graduation	5	5	5
2. increased dropout rate	4	13	17
3. increased failure rate	5	7	8
4. reduced electives (the # offered and the # students could take)	5	10	19
5. lack of funds	3	3	4
6. reduced vocational offerings	5	9	11
7. reduced fine arts offerings	2	3	4
8. hurt lower-achieving students	5	9	16
9. reduced choices and options for students	4	6	8

* Sample for this table is 5 states, 19 districts, and 32 schools.

TABLE 3 (continued)

DISTRICT AND SCHOOL RESPONDENTS' VIEWS ABOUT EFFECTS OF NEW GRADUATION REQUIREMENTS

Type of Response	# of States*	# of Districts*	#of Schools*
DISADVANTAGES (cont.)			
10. reduced flexibility in scheduling	4	4	5
11. reduced attendance	5	6	6
12. increased discipline problems	2	2	3
13. lack of teachers, space, equipment	5	7	8
14. raised anxiety of teachers	1	4	6
15. raised anxiety of students	3	5	6
16. increased summer school enrollment	5	4	6
17. increased workload for teachers	2	4	6
18. watered-down the curriculum	2	2	2
IDENTIFIED AS BOTH ADVANTAGES AND DISADVANTAGES:			
1. hired more teachers	3	4	5
2. challenged students (students had to work harder)	5	7	9
3. more exposure to science and math	5	11	13
4. increased standards and teacher expectations of students	3	3	3

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